



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Washington, D.C. 20235

NOV 20 1986

MEMORANDUM FOR: Distribution\*  
FROM: *Donald J. Leedy*  
F/M11 - Donald J. Leedy  
SUBJECT: Review of Amendment 15, Gulf of Alaska  
Groundfish

Attached for your review and comment is final Amendment 15 to the Fishery Management Plan for the Gulf of Alaska Groundfish Fishery (FMP). Day 1 was November 20, 1986. This action is being reviewed under the revised procedures of Public Law 99-659, approved November 14, 1986.

Please provide your comments (including "no comments") by December 12, 1986. If you have any questions, please call me at 673-5272.

Attachments

\*Distribution

F/ML - Roe, ~~Frick~~, Hockman  
F/M5 - Pallozzi  
F/M11 - Surdi, Stone  
F/M12 - Clem, Jackson  
GCF - Luipold  
GCEL - Frailey  
F/PP - Everett  
F/M21 - Hutchinson  
F/M3 - Meehan  
F/M41 - Karnella  
F/M42 - Rubelmann  
F/S1 - Pedrick  
F/S21 - Holliday  
PP2 - Cottingham  
OGC - Malone, Moran  
OMB - Fox





F/ML:PHF

December 1, 1986

MEMORANDUM FOR: F/ML - Donald J. Leedy

FROM: F/ML - Peter H. Fricke

SUBJECT: Review of Amendment 15, Gulf of Alaska Groundfish FMP

As requested I have reviewed the amendment as requested for possible social impacts. The amendment has the effect of converting the FMP into a framework plan, and to this extent I had expected that the amendment would contain social and economic criteria for the "trigger" actions of in-season changes. The amendment does not contain any socioeconomic criteria, nor does it contain, other than in generalities, a hierarchy for ranking (considering) social and economic impacts. The statement (on page 7 of the EIR) that "In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States" does not provide the RD with guidance in his management actions, other than a free hand to decide what benefits he (the RD) would care to choose.

Specific comments are as follows:

In "Changes to the FMP":

Section 3.3.11 - (H) Limited Entry. This section paraphrases the limited entry section of the Magnuson Act [303(b)(6)] except that it omits consideration of "historical fishing practices in, and dependence upon, the fishery." This aspect may be implied by the Council in its introductory sentence, but this is not clear. Since the Council has referred to subsistence fishing elsewhere, as well as the economic dependence of communities and segments of the industry on this resource, the section should be amplified and explicit language put in confirming that the historical practices and dependence will be considered.

In the EIR:

EIR, page 8: In the discussion of management goals and objectives, it is noted that estimates of the subsistence fisheries will be difficult to achieve because data is currently unavailable. It should be noted that the Division of Subsistence, Alaska Department of Fish and Game has undertaken subsistence studies in many of the communities around the Gulf of Alaska (and many of these studies describe recreational fishing too). Information on the subsistence fisheries can be extrapolated from these studies, as can other social and economic information on Alaskan fishing communities.

CODE	SURNAME	DATE	CODE	SURNAME	DATE

cc: F/ML:PHF  
FILE COPY

1950

ALASKA - DENVER - WASHINGTON - LOS ANGELES

FROM: Bureau of Economic Warfare

TO: SAC, NEW YORK

RE: [Illegible]

As requested, I have reviewed the material... The material was the subject of a report... and to this extent I had expected that the material... and economic criteria for the... and economic criteria for the... other than in generalities, a history for... become the subject. The subject for... location and harvesting systems... to maintaining... and... the... and... the... and...

Specific information is as follows:

Section 103-11 - (1) Alaska... section of the... (2) Alaska... (3) Alaska... (4) Alaska... (5) Alaska... (6) Alaska... (7) Alaska... (8) Alaska... (9) Alaska... (10) Alaska...

In the...

Page 2: In the... that... data... Alaska... of the... information... on the... economic... on Alaska...

ALASKA - DENVER - WASHINGTON - LOS ANGELES

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL  
FISHERY MANAGEMENT PLAN FOR THE  
GULF OF ALASKA GROUND FISH FISHERY

AMENDMENT 15

Changes to the FMP

I. SUMMARY

Amendment 15 was approved by the Council at its September 24-26, 1986 meeting. The amendment makes the following changes to the FMP:

- (a) Revises management goals and objectives.
- (b) Establishes an administrative framework procedure for setting annual harvest levels without plan amendment.
- (c) Revises catch reporting requirements for at-sea processor vessels.
- (d) Establishes four time/area closures effective for three years for nonpelagic trawling to protect king crab around Kodiak Island.
- (e) Expands the field order authority for making inseason adjustments of harvest quotas and bycatch limits.

II. CHANGES TO THE RELEVANT SECTIONS OF THE FMP

A. Revise the following sentence in the FMP summary:

Page S-1, Paragraph 5. Delete the paragraph and replace it with the following paragraph:

The major groundfish species represented in the Gulf of Alaska fishery are considered resident in that area and include walleye pollock, Pacific cod, sablefish, Pacific ocean perch, halibut, turbot, flathead sole, rock sole and Atka mackerel. Acceptable biological catch evaluations have been made for each of the species or species groups being managed by this plan. The total optimum yield for the Gulf groundfish complex is presented as a range of 116,000-800,000 mt.

B. In the summary entitled "History of Amendments," page S-5, make the following changes and additions:

Amendment 14 - to "Effective," add the date "9/26/85."

Add to the summary:

Amendment 15 - (Effective \_\_\_\_\_)

Revised the goals and objectives for management; established an administrative framework procedure for setting annual harvest levels without plan amendment; eliminated species-specific OYs and established a 116,000-800,000 mt OY range for the Gulf groundfish complex as a whole; revised catch reporting requirements for at-sea processor vessels; established a time/area closure scheme, effective for three years, for nonpelagic trawling to protect king crab around Kodiak Island; and expanded the field order authority for making inseason adjustments.

- C. In the Table of Contents, beginning on Page 1-1, revise to accommodate the amendments described in this document.
- D. In Section 2.1, "Goals and Objectives for Management Plan," page 2-1, delete Section 2.1 and replace it with the following:

2.1 Goals and Objectives for Management of Gulf Groundfish Fisheries

The North Pacific Fishery Management Council (NPFMC or the Council) is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States. Such management will:

- (1) Conform to the National Standards and to NPFMC Comprehensive Fishery Management Goals;
- (2) Be designed to assure that to the extent possible:
  - (a) commercial, recreational, and subsistence benefits may be obtained on a continuing basis.
  - (b) minimize the chances of irreversible or long-term adverse effects on fishery resources and the marine environment;
  - (c) a multiplicity of options will be available with respect to future use of the resource; and
  - (d) regulations will be long-term and stable with changes kept to a minimum.

Principal Management Goal: Groundfish resources of the Gulf of Alaska will be managed to maximize positive economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economic benefits include, but are not limited to, profits, benefits to consumers, income and employment.

To accomplish this goal, a number of objectives will be considered:

Objective 1: The Council will establish annual harvest guidelines, within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

Objective 2: In its management process, including the setting of annual harvest guidelines, the Council will account for all fishery-related removals by all gear types for each groundfish species, sport fishery and subsistence catches, as well as by directed fisheries.

Objective 3: The Council will manage the fisheries to minimize waste by:

- (a) Developing approaches to treating bycatches other than as a prohibited species. Any system adopted must address the problems of covert targeting and enforcement.
- (b) Developing management measures that encourage the use of gear and fishing techniques that minimize discards.

Objective 4: The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic fishery operations.

Objective 5: The Council will develop measures to control effort in a fishery, including systems to convert the common property resource to private property, but only when requested to do so by industry.

Objective 6: Rebuilding stocks to commercial or historic levels will be undertaken only if benefits to the United States can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.

Objective 7: Population thresholds will be established for economically viable species or species complexes under Council management on the basis of the best scientific information, and ABCs will be established as defined in this document. If population estimates drop below these thresholds acceptable biological catch (ABC) will be set to reflect necessary rebuilding as determined in Objective 6.

E. In Section 2.2, "Operational Definitions of Terms," Part 1, "Determinants of catch levels," page 2-3, delete items (c) and (d) and replace with the following:

(c) Acceptable biological catch (ABC) - is a seasonally determined catch that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitments. The Council can set the ABCs for individual species anywhere between zero and the maximum possible removal based on the best scientific information presented by the Plan Team and/or Scientific and Statistical Committee. The ABC may be modified to incorporate safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the maximum sustainable yield exploitation rate multiplied by the size of the biomass for the relevant time period. The ABC is defined as zero when the stock is at or below its threshold.

(d) Target quotas (TQ) - the harvest quota for a species or species group; the retainable catch. TQ will be apportioned to DAP, JVP, and possibly TALFF, by area.

(e) Prohibited species catch - a nonretainable catch. It can take the form of a prohibited or nongroundfish species and/or as a fully utilized groundfish species captured incidentally in groundfish fisheries. Such catch must be recorded and returned to the sea with a minimum of injury. A prohibited species catch limit (PSC) is an apportioned, nonretainable amount of fish provided to a fishery for bycatch purposes. PSC limits of groundfish may be provided to JVP and TALFF when the species is fully utilized by the wholly domestic fishery (ie.  $DAP=TQ$ ).

(f) Optimum yield (OY) (generic) - is the amount of fish (a) which will provide the greatest overall benefit to the nation; (b) which is prescribed as such on the basis of the MSY from such fishery, as modified by any relevant economic, social, or ecological factor.

(specific) - for Gulf of Alaska groundfish resources as a whole, the OY is specified as a range established from historical fishery performance and estimates of MSY for each species.

- F. In Section 2.2, "Operational Definitions of Terms," delete Part 4, page 2-6.
- G. Beginning with Section 3.0, "Description of the Fishery," and ending with Section 11.0, "Appendices," replace the term optimum yield (OY) with target quota catch (TQ) where appropriate.
- H. Delete Section 6.0, "Optimum Yield Concept," Parts 6.0 through 6.3, pages 6-1 to 6-11, and Part 5, page 6-13, and replace it with the following sections:

#### 6.0 SETTING HARVEST LEVELS

A procedure has been developed whereby the Council can set harvest levels by specifying a target quota (TQ) for each groundfish fishery on an annual basis. The procedure consists of four steps:

- (1) Determining the ABC for each managed species or species group.
- (2) Determining a TQ based on biological and socioeconomic information. The TQ may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the TQ may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC.
- (3) Identify what groundfish species will be fully utilized by the wholly domestic fishery. Determine a PSC limit in these fully utilized fisheries based on biological and socioeconomic information for joint venture and foreign fisheries. The sum of TQ and PSC for any groundfish species cannot result in overfishing.
- (4) Sum TQ for all groundfish species excluding nonspecified species to assure that the sum is within the OY range specified in the FMP. If the sum falls outside this range the TQs must be adjusted or the plan amended.

#### 6.1 Procedure for Setting Target Quotas

The timing of actions and procedure to be taken in establishing target quotas (TQs) is as follows:

- (1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary ABCs, and initial TQs for all managed groundfish species. TQ will be specified for DAP, JVP, and TALFF. For fully utilized species (where DAP = TQ), there will be no retainable catch available for JVP and TALFF. Each TQ may be apportioned among the regulatory areas and districts of the Gulf of Alaska.



- (2) September Council meeting. Council will approve preliminary TQs and release the RAD for a 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TQs for DAP, JVP, and TALFF. Public comments on the proposed TQs will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TQ limits. Final TQs are added to assure that the sum is within the OY range.
- (6) By January 1 the Secretary will publish a rule-related notice of final TQ limits in FEDERAL REGISTER.
- (7) January 1. Annual TQ limits take effect for the current fishing year.

## 6.2 The OY Range

The range of OY specified in the FMP is 116,000-800,000 mt of groundfish. This range was established by examining for each major groundfish species, historical and recent catches, recent determinations of ABC, and the current and past estimates of MSY (Tables 6.1 and 6.2).

In particular, the end points of the range were derived as described below: For the minimum value, 116,000 mt is approximately equal to the lowest historical groundfish catch during the 21-year period 1965-1985 (116,053 mt in 1971). In that year catches of pollock, Pacific cod and Atka mackerel were all at very low levels. Given the current status of the groundfish resources and the present management regime, it is considered extremely unlikely that future total harvest will fall below this level. Thus, the TQs will be established so as to result in a sum of at least 116,000 mt.

The upper end of the OY range, 800,000 mt, was derived from MSY information. The MSY for all species of groundfish (excluding the other species category) has ranged from 804,950 mt in 1983 to 1,000,750 mt for the 1987 fishing year. The average MSY over the five-year period is 845,670 mt. Therefore, the upper end of the range is approximately equal to 95% of the mean MSY for the last recent five-year period. It is possible that in the immediate future, the Council may wish to establish TQ equal to MSY for all species. It should be noted that to do this the Council would have to amend the upper bound of the OY range.

The ABC summed for all species has ranged from 457,082 mt in 1985 to 720,005 mt in 1984, with an ABC recommended for 1987 of 619,352 mt. The upper end of the OY range is some 29% larger than the 1987 recommended ABC allowing for future expansion in the fishery to that extent.

Table 6.1 Historical annual groundfish catch in the Gulf of Alaska  
(in metric tons), 1965-1982.

Year	SPECIES Landings, mt						TOTAL
	Pollock	Cod	Sablefish	Rockfish	Flatfish	Atka mackerel	
1965	2,746	583	3,458	382,481	4,697	0	393,965
1966	8,940	459	5,178	148,439	4,928	0	167,944
1967	6,432	2,154	6,143	112,741	4,506	0	131,976
1968	6,168	1,046	15,049	108,594	3,468	0	134,325
1969	17,914	1,357	19,375	79,238	2,676	0	120,560
1970	15,970	1,830	25,694	63,674	3,859	7,281	118,308
1971	9,458	703	25,542	77,985	2,365	0	116,053
1972	34,166	3,572	36,453	77,564	8,942	6,282	166,979
1973	36,989	5,548	27,487	61,414	19,566	9,494	160,498
1974	61,474	5,353	28,006	61,193	9,733	17,531	183,290
1975	53,568	5,985	26,094	58,908	5,487	27,776	177,818
1976	79,526	7,089	27,733	56,983	6,092	15,539	192,962
1977	118,062	2,261	17,135	23,729	16,724	19,455	197,366
1978	97,405	12,167	8,875	10,198	15,180	19,586	163,411
1979	105,783	14,872	10,352	11,489	13,922	10,959	167,377
1980	115,037	35,327	8,509	16,088	15,889	13,166	204,016
1981	147,743	36,086	9,917	18,214	12,532	18,727	243,219
1982	168,746	29,380	8,557	10,731	7,729	6,760	231,903

Sources: Lynde, Marcella. 1986. The historical annotated landings database documentation of annual harvest of groundfish from the Northeast Pacific and E. Bering Sea, 1957-1980. NOAA Technical Mem., NMFS F/NWC-103.

PacFIN final annual reports, 1981-1982.

Table 6.2 Gulf of Alaska MSYs, ABCs, and catches for the period 1983-87.

YEAR	Pollock	Pacific Cod	Flounders	Pacific Ocean Perch	Sablefish	Atka Mackerel	Rockfish	Thornyhead	Squid	Totals, All species
1983	MSY ABC Catch	334,000 256,000 215,612	177,000 67,000 67,000 12,260	150,000 25,000 7,406	25,000 13,000 9,061	33,000 28,700 12,260	10,200 7,600 2,001	3,750 3,750 730	5,000 5,000 271	804,958 466,058 296,077
1984	MSY ABC Catch	334,000 516,600 285,563	177,000 67,000 67,000 6,112	150,000 21,875 4,325	25,000 9,480 9,918	33,000 28,700 857	10,200 7,600 1,278	3,750 3,750 183	5,000 5,000 95	804,958 720,003 330,008
1985	MSY ABC Catch	334,000 321,600 261,865	177,000 67,000 33,500 2,157	150,000 11,474 925	25,000 9,480 11,620	33,000 4,678 1,859	10,200 7,600 442	3,750 3,750 38	5,000 5,000 12	804,958 457,082 291,894
1986	MSY ABC Catch	334,000 116,600 57,039	136,000 136,000 19,117	150,000 10,500 538	25,000 18,800 17,346	7,800 4,700 0	10,200 n/a 1,388	3,750 n/a 346	5,000 n/a 8	812,758 n/a 97,111
1987	MSY ABC/FHG	334,000 113,600	125,000 125,000	150,000 3,702	25,000 25,000	7,800 600	10,200 2,700	3,750 3,750	5,000 5,000	1,000,758 619,352
STATISTICS										
Range	MSY, min. MSY, max. ABC, min. ABC, max. Catch, min. Catch, max.	334,000 334,000 113,600 516,600 57,039 285,563	125,000 177,000 60,000 136,000 12,976 36,476	150,000 150,000 3,702 7,406	25,000 25,000 9,480 25,000 9,061 17,346	7,800 33,000 600 28,700 0 12,260	10,200 10,200 2,700 2,001	3,750 3,750 3,750 3,750 38 730	5,000 5,000 5,000 5,000 8 271	804,958 1,000,758 457,082 720,003 97,111 330,008
Mean	MSY ABC Catch	334,000 264,880 205,020	158,400 88,200 22,562	150,000 14,510 3,299	25,000 15,152 11,986	22,920 13,476 3,744	10,200 6,375 1,277	3,750 3,750 324	5,000 5,000 97	845,678 565,622 253,773
Std. error	MSY ABC Catch	0 66,793 39,830	10,306 15,524 3,861	0 3,501 1,249	0 2,678 1,444	5,521 5,599 2,218	0 1,061 248	0 0 116	0 0 48	34,703 55,009 40,986

Source: PacFIN and Gulf of Alaska Groundfish Plan Team Reports, 1982-86

Most of the variation in the ABC and catch over the five-year interval results from changes in the status of two species: pollock and flounder. Pollock ABC has ranged from 113,600 mt in 1987 to 516,600 mt in 1984, a greater than 400,000 mt deviation. Likewise, flounder ABC was 33,500 mt in 1985 and 340,000 mt for 1987. The variation in flounder ABC is therefore approximately 300,000 mt. Therefore, the 800,000 mt upper end of the OY range was selected in consideration of the volatility in pollock and flounder ABC, the potential for harvesting at MSY, and the desire to allow for some moderate expansion in the future flounder fisheries.

### 6.3 Procedure for Setting Joint Venture and Foreign Prohibited Species Catch Limits of Fully Utilized Species

The timing of actions and procedure to be taken in establishing prohibited species catch limits (PSCs) of fully utilized species is as follows:

- (1) September. Following the initial determination of TQs for all managed groundfish species as described in Section 6.1, the plan team will identify those groundfish species that are fully utilized by the wholly domestic fishery. For those species, initial PSC limits will be calculated for joint venture and foreign fisheries using the best available bycatch rates obtained by NMFS observers from the respective fisheries and applying it to initial joint venture (JVP) and foreign (TALFF) TQ apportionments. Each PSC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.
- (2) September Council meeting. Council will review and approve preliminary PSCs and RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed PSCs for JVP and TALFF. Public comments on the proposed PSCs will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan Team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual PSC limits.
- (6) By January 1 the Secretary will publish a rule-related of final PSC limits in the FEDERAL REGISTER.
- (7) January 1. Annual PSC Limits take effect for the current fishing year.

### 6.4 The Resource Assessment Document

For purposes of supplying scientific information to the Council for use in utilizing the above procedure, a resource assessment document (RAD) will be prepared annually. The (RAD) will at a minimum contain the following information:

- (1) Current status of Gulf of Alaska Groundfish resources, by major species or species group.
- (2) Estimates of maximum sustainable yield (MSY) and acceptable biological catch (ABC).
- (3) Estimates of groundfish species mortality from nongroundfish fisheries, subsistence fisheries, and recreational fisheries, and the difference between groundfish mortality and catch, if possible.
- (4) Catch statistics (landings and value) for the current year.
- (5) The projected responses of stocks and the fisheries to alternative levels of fishing mortality.
- (6) Any relevant information relating to changes in groundfish markets.
- (7) Plan team recommendations for target quotas (TQ) by species or species group and area, and prohibited species catch limits (PSCs) of fully utilized species to joint venture and foreign fisheries with supporting justification and rationale.
- (8) Any other biological, social, or economic information which may be useful to the Council.

The Council will use:

- (1) recommendations of the plan team and SSC and information presented by the PT and SSC in support of these recommendations;
- (2) information presented by the AP and the public; and
- (3) other relevant information,

to develop its own preliminary recommendations.

It should be noted that the attainment of a TQ for a species will result in the closure of the target fishery for the species. That is, once the TQ is taken further retention of that species will be prohibited. Other fisheries targeting on other species could be allowed to continue as long as the nonretainable bycatch of the closed species is found to be nondetrimental to that stock. Similarly, the attainment of a PSC limit of a fully utilized species will result in the closure of the applicable fishery.

With the exception of the "other species" management category, the framework procedure described above is used to determine TQs for every groundfish species and species group managed by the plan. Groundfish that support their own fishery, and for which a sufficient data base exists that allows each to be managed on the basis of its own biological, social, economic, and ecological merits, are called "target species". Groundfish species that are not specified as a target species are collectively grouped in the "other species" category. These species currently are of slight economic value and are generally not targeted upon. This category, however, contains species with economic potential or which have importance to the ecosystem, but which

lack sufficient data to allow separate management. Accordingly, a single TQ, equal to 5% of the combined TQs for target species shall apply to this category. Records of catch of this category must be maintained.

All other species of fish and invertebrates taken incidentally that are not managed by other FMPs and are associated with groundfish fisheries, are designated as "nonspecified species" and catch records need not be kept.

#### 6.5 Reserves

Reserves are set at 20% of each species and/or species group. At any time, the Regional Director may assess the DAP or JVP and apportion to them any amounts from the reserves that he finds will be harvested by U.S. vessels. As soon as practicable after April 1, June 1, and August 1, and on any such dates as he determines appropriate, the Regional Director may apportion to TALFF any portion of the reserves that he determines will not be harvested by U.S. fishing vessels during the remainder of the fishing year.

Any additional inseason allocation to JVP and TALFF from reserves may carry with it an additional PSC limit amount of fully utilized species proportional to that reserve release and the respective bycatch rates in the affected fisheries.

- I. In Section 8.0, "Management Regime," delete Part 8.1, "Management Objectives," page 8-1, and replace with the following:

##### 8.1 Management Objectives

This FMP is based on one primary goal and seven objectives which dictate the philosophy of management for the groundfish fishery in the Gulf of Alaska. They are described in detail in Section 2.1.

- J. In Section 8.3.1.1., "Domestic Season, Gear, Area and Catch Restrictions," page 8-2, under the heading "(D) Time/area Closures," add the following:

##### (3) Time/area closures and gear restrictions to control king crab bycatch.

A three-year time/area closure scheme has been developed to help protect and help rebuild the Kodiak king crab resource. The number of red king crab in the waters around Kodiak Island are at historically low levels, with most being old, sexually mature animals. There has been no sign of significant recruitment in seven years. As a result, the Kodiak commercial king crab fishery has been closed since 1983 in an attempt to rebuild the stocks. During this same period a developing domestic groundfish fishery using a variety of gear has displaced most foreign fisheries. While the cause for the decline of king crab is not known, most researchers believe that the decline can be attributed to a variety of environmental factors which independently or in combination led to the depressed condition of the resource. The extent to which the king crab decline is due to commercial fishing, either directed or incidental, is unknown.

King crab are known to concentrate in certain areas around Kodiak Island during the year. In the spring they migrate inshore to molt and mate. Approximately 70% of the female red king crab stocks are estimated to congregate in two areas, known as the Alitak/Towers and Marmot Flats. The Chirikof Island and Barnabas areas also possess concentrations of king crab but in lesser amounts. Past studies have shown that most king crab around Kodiak molt and mate in the March-May period, although some molting crab can be found during late-January through mid-June. Adult female king crabs must molt to mate and extrude eggs. After molting, their exoskeleton (shell) is soft, and crabs in this stage are known as soft-shell crabs. The new exoskeletons take two to three months to harden fully. During the soft-shell period, the crabs are particularly susceptible to injury and mortality from handling and from encounters with fishing gear. Because many of the present and potential groundfish trawling grounds overlap with the mating grounds of king crab, the potential exists for substantial king crab mortality.

While it is generally assumed that king crab mortality during the soft-shell phase can be high with any gear type, incidental mortality of hard-shell crab as a result of encounters with fishing gear is not known. Nonpelagic (or bottom) trawl fishing could kill or injure king crab in two ways. First, crabs caught in the net can be crushed during the tow or injured as the catch is unloaded in the fishing vessel. Second, crabs might be struck with parts of the gear (e.g., trawl doors, towing cables, groundlines, roller gear) as the trawl is towed along the bottom.

Two area designations have been established for purposes of protecting king crab stocks to varying degrees from groundfish nonpelagic trawling and are described in Figure 8.1 and Table 8.1.

- K. In Section 8.3.1.1, "Domestic Season, Gear, Area and Catch Restrictions," page 8-2, replace the text under Section (G) - "Inseason Adjustment of Time and Area" with the following text; page 8-3, re-label Section (H), "Issuance of Field Orders" to section H, "Limited entry" and delete text in Section (H) that addresses issuance of field orders.

(G) Inseason Adjustments. Harvest levels or target quotas (TQs) for each groundfish species or species group that are set by the Council for a new fishing year are based on the best biological, ecological, and socioeconomic information available. The Council finds, however, that new information and data relating to stock status may become available to the Regional Director and/or the Council during the course of a fishing year that warrants inseason adjustments in a fishery. Such changes in stock status might not have been anticipated or were not sufficiently understood at the time harvest levels were being set. Such changes may become known from events within the fishery as it proceeds, or they may become known from new scientific survey data. Certain changes warrant swift action by the Regional Director to protect the resource from biological harm by instituting gear modifications or adjustments through closures or restrictions. Other changes warrant action by the Regional Director to provide greater fishing opportunities for the industry by instituting time/area adjustments through openings or extension of a season beyond a scheduled closure.

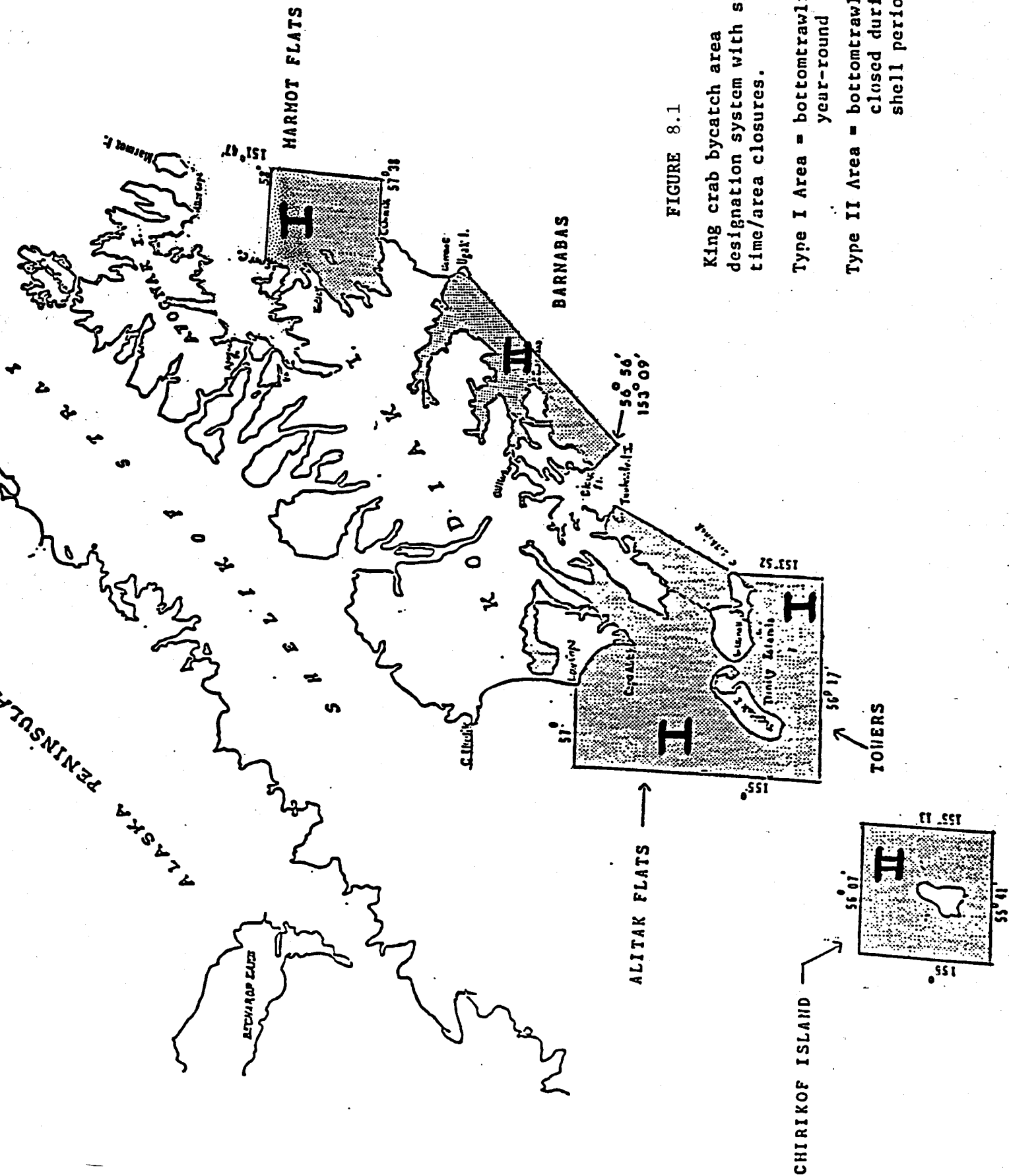


FIGURE 8.1

King crab bycatch area designation system with specific time/area closures.

Type I Area = bottomtrawling closed year-round

Type II Area = bottomtrawling closed during soft-shell period



Table 8.1 Definitions of King Crab Bycatch Areas

<u>Area Type</u>	<u>Name and Definition</u>
I	Type I areas are those king crab stock rebuilding areas where a high level of protection to king crab will be provided by closing the area year-round to nonpelagic trawling. Fishing with other gear would be allowed.
II	Type II areas are those areas sensitive for king crab populations and in which nonpelagic trawling will be prohibited during the soft-shell season, February 15 - June 15. Fishing with other gear would be allowed year round and fishing with nonpelagic trawl gear would be allowed from January 1 - February 14 and June 16 - December 31.

Areas designated as either Type I or II are shown in Figure 8.1.

The need for adjustment may be related to several circumstances. For instance, certain target or bycatch species may have decreased in abundance. When current information indicates that a species has decreased in abundance, allowing a fishery to continue to a harvest level now known to be too high could increase the risk of overfishing that species. Likewise, current information relating to prohibited species, i.e., those species that must be returned to the sea, might become available that indicates their abundance has decreased. Conservation measures limited to establishing prohibited species catch (PSC) limits for such prohibited species may be necessary during the course of the fishery to prevent jeopardizing the well-being of prohibited species stocks.

When current information demonstrates a harvest level to have been set too low, closing a fishery at the annually specified harvest level would result in underharvesting that species, which also results in the fishery unnecessarily foregoing economic benefits during that year unless the total allowable catch were increased and the fishery allowed to continue.

Similarly, current information may indicate that a prohibited species was more abundant than was anticipated when (PSC) limits were set. Closing a fishery on the basis of the preseason PSC limit that is proven to be too low would impose unnecessary costs on the fishery. Increasing the PSC limits may be appropriate if such additional mortality inflicted on the prohibited species of concern would not impose detrimental effects on the stock or unreasonable costs on a fishery that utilize the prohibited species. However, adjustments to target quotas or PSC limits which are not initially specified on the basis of biological stock status are not appropriate.

The Council finds that inseason adjustments are accomplished most effectively by management personnel who are monitoring the fishery and communicating with those in the fishing industry who would be directly affected by such adjustments. **Therefore, the Council authorizes the Secretary by means of his delegation to the Regional Director, NMFS, to make inseason adjustments to conserve fishery resources on the basis of all relevant information.** Using all available information, he may extend, open or close fisheries in any or part of a regulatory area, or restrict the use of any type of fishing gear as a means of conserving the resource. He may also change any previously specified TQ or PSC limit if such are proven to be incorrectly specified on the basis of the best available scientific information on biological stock status. Such inseason adjustments must be necessary to prevent one of the following occurrences:

- (1) The overfishing of any species or stock of fish, including those for which PSC limits have been set.

- (2) The harvest of a TQ for any groundfish, the taking of a PSC limit for any prohibited species, or the closure of any fishery based on a TQ or PSC limit which on the basis of currently available information is found by the Secretary to be incorrectly specified.

The types of information which the Regional Director must consider in determining whether stock conditions exist that require an inseason management response are described, as follows, although he is not precluded from using information not described but determined to be relevant to the issue.

- (A) The effect of overall fishing effort within a regulatory area.
- (B) Catch per unit of effort and rate of harvest.
- (C) Relative abundance of stocks within the area.
- (D) The condition of the stock within all or part of a regulatory area.
- (E) Any other factors relevant to the conservation and management of groundfish species or any incidentally caught species which are designated as a prohibited species or for which a PSC limit has been specified.

The Regional Director is constrained, however, in his choice of management responses to prevent potential overfishing by having to first consider the least restrictive adjustments to conserve the resource. The order in which the Regional Director must consider inseason adjustments to prevent overfishing are specified as: (1): Any gear modification that would protect the species in need of conservation protection, but which would still allow fisheries to continue for other species; (2) a time/area closure which would allow fisheries for other species to continue in non-critical areas and time periods; and, (3) total closure of the management area and season.

The procedure which the Secretary must follow requires that the Secretary publish a notice of proposed adjustments in the FEDERAL REGISTER before they are made final, unless the Secretary finds for good cause that such notice is impracticable or contrary to the public interest. If the Secretary determines that the prior comment period should be waived, he is still required to request comments for 15 days after the notice is made effective, and respond to any comments by publishing in the FEDERAL REGISTER either notice of continued effectiveness or a notice modifying or rescinding the adjustment.

To effectively manage each groundfish resource throughout its range, the Regional Director must coordinate inseason adjustments, when appropriate, with the State of Alaska to assure uniformity of management in both State and Federal waters.

Any inseason time/area adjustments made by the Regional Director will be carried out within the authority of this FMP. Such action is not considered to constitute an emergency that would warrant a plan amendment within the scope of section 305(e) of the Magnuson Act. Any adjustments will be made by the Regional Director by such procedures provided under existing law. Any inseason adjustments that are beyond the scope of the above authority will be accomplished by emergency regulations as provided for under section 305(e) of the Magnuson Act.

- (H) **Limited Entry.** Any limited entry program must be designed specifically for the fishery to which it will be applied, taking into consideration the unique characteristics of that fishery.

The fishery should be monitored and data collection started so that conditions such as those described above can be identified and measured. The data base should also indicate the character and level of participation in the fishery, including: (a) investment in vessel and gear; (b) the number and type of units of gear; (c) the distribution of catch; (d) the value of catch; (e) the economic returns to the participants; (f) mobility between fisheries; and (g) various social and community considerations.

The current condition of the groundfish fisheries of the Gulf of Alaska is such that limited entry programs for the domestic fleet will not be required in the near future. However, research and monitoring programs will be developed and implemented in a timely manner.

In Alaska, where groundfish fisheries may occur completely or partly in waters under State jurisdiction, some fisheries may eventually be included in a State limited entry program. Coordination between the North Pacific Fishery Management Council and the State will be necessary in order to develop a comprehensive program that recognizes unique local or regional conditions as well as the national standards of the Magnuson Fishery Conservation and Management Act.

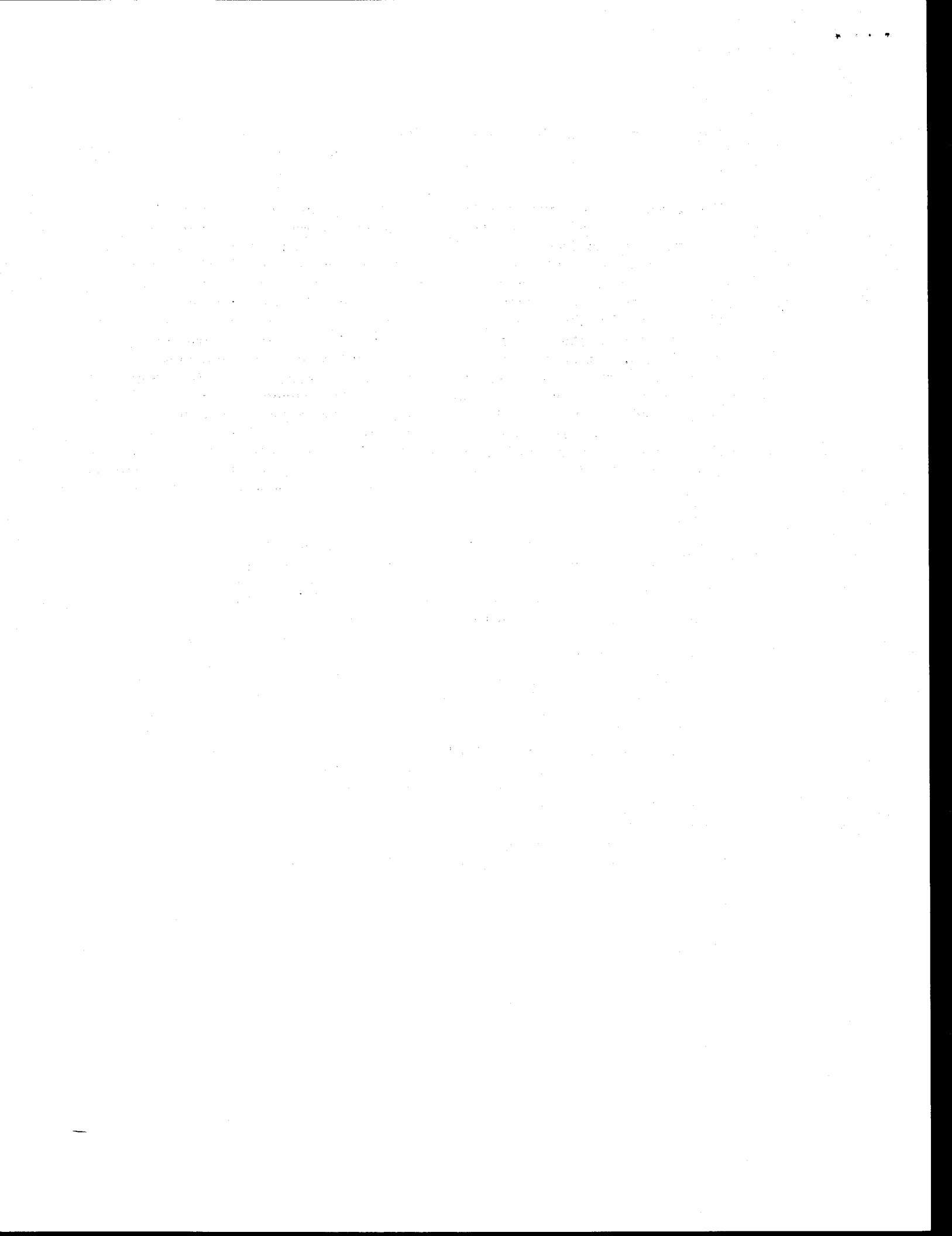
- L. In Section 8.3.2.1, "Foreign Season, Gear, Area and Catch Restrictions," page 8-8, under the heading "(c) Time/area closures," subpart (2), add the following:
- (d) Two area designations restricting nonpelagic trawling have been established for purposes of protecting king crab stocks to varying degrees and are described in Figure 8.1 and Table 8.1
- M. In Section 8.5.1, "Domestic Reporting Requirements," page 8-15, delete part "(C) Catcher/processors," subpart "(1) Reporting Requirements," and replace with the following:
- (C) At-sea processor vessels
- (1) Reporting requirements.

Vessels that catch and/or process groundfish at sea (catcher/processors) often do not land their catch for periods of several weeks.

Thus, while they are required to complete and submit a fish ticket upon landing their catch to the appropriate management agency within a period prescribed by regulation, catch information supplied by a fish ticket may not reach the management agencies in time to affect inseason management decisions concerning time/area adjustments or apportionments of surplus groundfish among the various users. Hence, those vessels that catch and process at sea are required to report the hail weights of their catch within a period prescribed by regulation. Such report must be in writing and must be submitted to the Director, Alaska Region, National Marine Fisheries Service. Reports will be required for each Sunday through Saturday period even though that vessel had reported its catch through the fish ticket system. This requirement would make inseason management of the fisheries more effective by: (1) eliminating time needed to resolve fish ticket discrepancies resulting from double counting, and (2) eliminating time lost due to delays in receiving fish ticket data.

Delayed catch reporting is also a problem for fully domestic mothership operations. Vessels that receive catch from other vessels and process that fish at sea (mothership/processors or floating processors) may remain at sea for long periods of time. Catcher vessels are required to complete a fish ticket every time they land fish, including deliveries to mothership/processors, and that these fish tickets be forwarded to the management agency prescribed by regulation, within 7 days of the date the fish was delivered. Mothership and/or floating processors customarily collect the fish tickets until an opportunity arises where they can be forwarded to a management agency. Delays in receipt of the fish tickets prevents their timely use in making inseason management decisions. Thus, mothership and/or floating processors that receive fish from a catcher vessel and retain it for any time period, would be required to report amounts of fish received from each catcher vessel. As with catcher/processor vessels, the report must be written, submitted to the Director, Alaska Region, National Marine Fisheries Service, and required for each Sunday through Saturday period.

Inseason catches by catcher/processor and catches received by mothership and/or floating processor vessels would be tabulated from just one source, the weekly report.



DRAFT  
ENVIRONMENT ASSESSMENT  
FOR AMENDMENT 15 TO THE FISHERY MANAGEMENT PLAN FOR THE  
GROUNDFISH FISHERY OF THE GULF OF ALASKA

PREPARED BY THE PLAN TEAM FOR THE  
GROUNDFISH FISHERY OF THE GULF OF ALASKA  
AND THE STAFF OF THE  
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

OCTOBER 1986





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## 1.0 INTRODUCTION

The domestic and foreign groundfish fishery in the fishery conservation zone (3-200 miles offshore) of the Gulf of Alaska is managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP). The FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (FCMA). It was approved by the Assistant Administrator for Fisheries, NOAA, (Assistant Administrator) and implemented December 1, 1978 (43 FR 52709, November 14, 1978). Amendments 1-11, 13, and 14 to the FMP have been approved by the Assistant Administrator. Amendment 12 was adopted initially by the Council at its July and December 1982 meetings but was later rescinded by the Council at its September 1984 meeting without having been submitted formally for Secretarial review.

The Gulf of Alaska groundfish fishery consists of a number of distinct fisheries that can be defined by gear, target species, and mode of operation. Each of these fisheries is a multispecies fishery to some degree due to the use of only partially selective gear or targeting strategies. These fisheries are characterized by: (1) resources that are subject to large fluctuations; (2) the rapid (and for most species complete) replacement of foreign fisheries by wholly domestic and joint venture fisheries; and (3) changing market conditions and opportunities as the domestic groundfish industry strives to become fully developed. The FMP, as amended through 1985, is not adequate in managing such a fishery. It has a number of major deficiencies, the costs of which have increased as the foreign fisheries have been replaced by wholly domestic and joint venture fisheries. These deficiencies will tend to prevent the fishery management goals from being met in the Gulf of Alaska. These goals as defined by the MFCMA, related federal policy, and the Council are to: (1) protect the long-term productivity of living marine resources by preventing either overfishing or fishing related degradation to fishery habitat; and (2) within the bounds set by this conservation goal, provide a management environment that will result in the allocation of these resources that will generate the greatest benefit to the nation.

Work toward a revised Gulf of Alaska Groundfish FMP was initiated during the December 1984 meeting of the North Pacific Fishery Management Council. Primary motivation for a revision was a continual increase in the number of proposed annual changes to the FMP. The Council formed a workgroup to begin work toward developing a set of goals and objectives for fisheries management in the Gulf of Alaska and also directed the Gulf of Alaska groundfish plan team (PT) to identify specific areas in need of change. In particular, the team was asked to identify management measures that require frequent revision and develop alternative measures that would streamline the plan and eliminate administrative delays.

The Council met in special session in August of 1985 to review the progress of both the plan team and the Goals and Objectives Workgroup and to provide direction for subsequent work. The workgroup has met five times since that August meeting, independently, and in conjunction with the plan team and Council staff. The product of those meetings are the goals and objectives approved for public review by the Council at its March, 1986 meeting. These goals and objectives are found in Chapter 2 of this document. The interaction

between the workgroup and the plan team was intended to provide a set of alternatives that reflect the intent of industry as well as adhere to biological and economic principles.

At its June 24-26, 1986 meeting, the Council reviewed the status of the FMP and certain problems that have been identified, either through experience gained from eight years of fishery management or through situations unforeseen as the domestic fishery has developed. These management problems are:

- (1) Inability to adjust harvest guidelines efficiently.
- (2) Inadequate domestic reporting requirements.
- (3) Trawl-induced mortality on king crab stocks near Kodiak Island.
- (4) Inadequate inseason management authority.

The Council received recommendations from the PT, the Advisory Panel (AP), and the Scientific and Statistical Committee (SSC) on alternative management measures that could be adopted, as Amendment 15 to the FMP, to resolve the problems. The Council adopted a "public hearing" package for consideration by the public, the fishing industry, and management agencies that analyzes the biological, ecological, and socioeconomic effects of these alternatives. One part of the package is the environmental assessment (EA) that is required by the National Oceanic and Atmospheric Administration in compliance with the National Environmental Policy Act of 1969. The purpose of the EA is to analyze the impacts of major Federal actions on the quality of human environment. It serves as a means of determining if significant environmental impacts could result from a proposed action. If the action is determined not to be significant, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An EIS must be prepared if the proposed action may be reasonably expected (1) to jeopardize the productive capability of the target resource species or any related stocks that may be affected by the action; (2) to allow substantial damage to the ocean and coastal habitats; (3) to have a substantial adverse impact on public health or safety; (4) to affect adversely an endangered or threatened species or a marine mammal population; or (5) to result in cumulative effects that could have a substantial adverse effect on the target resource species or any related stocks that may be affected by the action. Following the end of the public hearing, the Council could determine that Amendment 15 will have significant impacts on the human environment, and proceed directly with preparation of an EIS required by NEPA. This EA is prepared to analyze the possible impacts of alternative management measures to solve five management problems contained in Amendment 15. The management measures entailed in Amendment 15 allow forces of natural mortality to be considered in determining groundfish harvest levels. These forces of natural mortality may stem from either biotic or abiotic sources. Natural mortality resulting from biotic sources may include that stemming from predator/prey interactions. That is, in its framework for computing recommended harvest levels, proposed Amendment 15 enables managers to incorporate the effects of predation, e.g. predation on pollock by marine mammals and birds. When groundfish are harvested by the commercial fishery, the immediate effect on predator species may be negative, since a source of food will have been removed. However, the net effect may be either positive or negative, for two reasons. First, predator species may be able to switch to other food sources, thereby negating the effect of lowered groundfish abundance. Second, the indirect, ecosystem-level effects may counter-balance the direct effects,

since groundfish do not function in the marine ecosystem simply as prey species. Importantly, all groundfish species are predatory. Each consumes other groundfish as well as invertebrates.

Sablefish, for example, consume small pollock, Pacific cod, other sablefish, flounder, rockfish, herring, pink shrimp, crab, zooplankton, and bottom dwelling invertebrates. Pacific cod consume pollock, small flounders, dogfish, sculpins, herring, pink shrimp, crab, squid, octopus, and benthos. Pollock consume pelagic fish, other pollock, zooplankton, and pink shrimp. Some large mouth flounders such as arrowtooth flounder consume pollock, herring and other pelagic fish, pink shrimp, and zooplankton. Halibut consume Pacific cod, pollock, sablefish, other halibut, flounder, dogfish, sculpins, Pacific ocean perch and other rockfish, squid, octopus, salmon, herring and other pelagic fish, pink shrimp, crab, zooplankton, and benthos. Small mouth flounder consume pelagic fish, pink shrimp, crab, zooplankton, and benthos. Atka mackerel consume pollock, squid and octopus, herring, other pelagic fish, pink shrimp, and zooplankton. Pacific ocean perch consume squid and octopus, pelagic fish, and zooplankton. Other rockfish consume pollock, flounder, squid and octopus, pelagic fish, pink shrimp, crab, zooplankton, and benthos.

When predatory fish such as groundfish are harvested by the commercial fishery, the abundance of prey species will be influenced. This, in turn, may have a positive impact on the abundance of species which prey on groundfish. Thus, the long-term net effect of groundfish harvests on predators such as marine mammals and birds may be either positive or negative. The ultimate effect of groundfish harvests will inevitably be difficult to predict. This is especially true in light of the fact that the influence of other factors such as (1) physical changes in ocean chemistry, temperature, and weather conditions, and (2) biological changes in animal populations resulting from disease, competition between and among species, and changes in the physical environment could well mask the direct effects of any management practice.

Underharvesting a groundfish species will most likely result in a greater abundance of that species in the ecosystem, at least in the short run. Depending on the role of the particular groundfish species in the ecosystem, this may result in the consumption of more prey and/or it may provide more biomass for predators (including marine mammals and birds) in the system. On the other hand, overharvesting a groundfish species will most likely result in a lower abundance of that species in the ecosystem; thus, less prey may be consumed by the overharvested groundfish species and less biomass may be provided for other predators, at least in the short run. Removal of fish by fishing operations results in a net loss of nutrients to the ecosystem. At-sea processing returns a portion of those nutrients to the system. However, because of the nature of fish wastes, those nutrients will be available in large part to organisms lower in the food web.

Descriptions of each of the management problems and the environmental impacts of each of the proposed alternative solutions to the problems follows. The environmental impacts of each alternative are analyzed within the guideline provided by the National Environmental Policy Act of 1969.

### 1.1 Council's Preferred Alternatives

At its September 1986 meeting the Council approved Amendment 15 to the Gulf of Alaska Groundfish FMP for Secretarial review and implementation. The Council made its decisions after reviewing written public comments, public testimony, information contained in the draft Environmental Assessment (EA) and Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA), and the recommendations of the Advisory Panel (AP) and the Scientific and Statistical Committee (SSC). This section identifies those alternatives preferred by the Council and summarizes the rationale and background for their decision.

Two new alternatives were identified and selected as preferred solutions to the stated management problems during the meeting. For problem 1--inability to adjust harvest guidelines--a third framework approach was suggested by the plan team and SSC and adopted by the Council. For problem 3--king crab bycatch by non-pelagic trawlers in the vicinity of Kodiak Island--a variation intermediate between Alternatives 1 and 2 was suggested by the AP and chosen by the Council. The EA and RIR/IRFA have been revised to reflect these changes.

The scope and perspective of the analysis in the version of the documents sent out for public review, however, was sufficiently broad so as to bound the impacts of the new alternatives as well. It follows, therefore, that the analytical documents before the Council provided the information necessary for an informed decision.

### Revised Goals and Objectives for Management of Groundfish

With this amendment the Council has adopted a principle management goal whereby the Gulf of Alaska groundfish resources will be managed to maximize economic benefits to the U.S., consistent with its resource stewardship responsibilities. To help meet this goal the Council approved seven objectives which concern the setting of harvest levels while keeping mortality above biological thresholds, the design of management programs to account for all fishery-related removals, the desire to minimize wastage of fishery resources, the intent to manage the groundfish fishery to stimulate development of the domestic industry, the development of effort control measures only when requested by the industry, and the rebuilding of stocks only if the benefits outweigh the costs.

In late-1983 the Council was requested by the fishing industry to stabilize the planning environment of the domestic seafood industry by developing long-range plans for management of the Gulf of Alaska groundfish fisheries. At that time the FMP contained several management goals and objectives which were more or less a restatement of MFCMA National Standards. It was believed that more specific set of goals, pertaining to North Pacific fisheries in general, would provide a clearer sense of direction for the course of fishery management over the next decade. In December 1984 the Council adopted nine Comprehensive Fishery Management Goals. This set of comprehensive goals provided a basic framework for fishery-by-fishery development of specific goals and objectives. The new goal and supporting objectives contained in Amendment 15 is the Council's attempt to synthesize the priorities and

concerns of the groundfish fishing industry and to articulate the current management philosophies and procedures, balancing and blending the two into a form that will guide the management process.

Management Problem 1: Inability to efficiently adjust harvest guidelines.

The Council approved a new alternative, Alternative 3, as recommended by the plan team and SSC. This alternative is a framework approach to setting target quotas for individual species in the Gulf using the same basic procedure that is used in the Bering Sea FMP. Additionally, Alternative 3 includes a procedure for establishing prohibited species catch limits (PSC) for fully U.S.-utilized groundfish species. This alternative, unlike Alternatives 1 and 2, does not provide for a formal accounting of fishery-related mortality.

Alternative 3 is viewed as an administrative amendment which allows the annual setting of harvest quotas without plan amendment. The Council concurred with the advice of the SSC, and a minority of the AP is encouraging the plan team to continue development of a catch/bycatch, accounting/management framework.

Management Problem 2: Inadequate reporting requirements.

The Council approved Alternative 1 which stipulates that each U.S. vessel that processes fish at sea during the fishing year must report its catch on a weekly basis whenever it has fish on board, regardless of how long it holds the fish on board. The revision to existing reporting requirements also includes a definition of fish processing. The Council believed this alternative superior to the status quo since it reduces the possibility of double counting fish and guarantees timely catch reports from this segment of the fleet.

Management Problem 3: King crab bycatch in Kodiak non-pelagic trawl groundfish fisheries.

The Council adopted Alternative 3 which establishes four time/area closures for non-pelagic trawling to protect king crab around Kodiak Island. All three alternatives were identical with the exception of the amount of area to be closed in Marmot Flats. Alternative 3, proposed by the Advisory Panel, closes more of Marmot Flats than Alternative 1 but less than Alternative 2. The small Marmot area of Alternative 1 was based on fishermen observations which showed a concentration of king crab in the area during the summer months. Additional testimony from fishermen at the Council's September meeting indicated that king crab migrate outside the small area at different times of the year. For this reason, the Council favored Alternative 3 since it would provide protection to king crab all year. Alternative 2 was rejected since the additional closed area did not appear to provide any significant benefits to king crab while the costs of closing the entire area to non-pelagic trawling appeared high.

Management Problem 4: Inadequate authority for inseason adjustment.

The Council approved a revised and clarified Alternative 1. This improvement of existing authority allows the Regional Director to use all relevant scientific information in making inseason time/area adjustments of the fishery. Their decision was based on the understanding that this authority

will be used only in the case of true emergency, such as the prevention of overfishing. The Council intends that the least restrictive management response possible will be exercised, but that increasingly restrictive measures would be implemented as necessary. Alternative 2 was rejected by the Council since it allowed inseason adjustments of target quotas and bycatch limits for socioeconomic as well as conservation reasons.

The description of Alternative 1 in the EA and RIR/IRFA has been revised to reflect the Council's intent. The analysis in the earlier draft adequately described the impacts of the revised alternative.



## 2.0 THE GOALS AND OBJECTIVES OF FISHERIES MANAGEMENT IN THE GULF OF ALASKA

### 2.1 A Revised Set of Goals and Objectives for Management of the Gulf of Alaska Groundfish Plan - Implications

The Council-appointed workgroup on goals and objectives for the Gulf of Alaska FMP has drafted a revised set of goals and objectives for insertion in the FMP. The group's recommendations to the Council were approved for public review at the March 1986 meeting and are listed below.

#### Gulfwide Groundfish Management Goals and Objectives

The Council is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States. Such management will:

- (1) Conform to the National Standards and to NPFMC Comprehensive fishery management goals.
- (2) Be designed to assure that to the extent practicable:
  - (a) Commercial, recreational, and subsistence benefits be obtained on a continuing basis.
  - (b) Minimize the chances of irreversible or long-term adverse effects on fishery resources and the marine environment.
  - (c) A multiplicity of options will be available with respect to future uses of these resources.
  - (d) Regulations will be long term and stable with changes kept to a minimum.

Principal Management Goal: Groundfish resources of the Gulf of Alaska will be managed to maximize economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economic benefits include, but are not limited to, profits, benefits to consumers, income, and employment.

To implement this goal, the Council establishes the following objectives:

Objective 1 - The Council will establish annual harvest guidelines within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

Objective 2 - In its management process, including the setting of annual harvest guidelines, the Council will account for all fishery related removals by all gear types for each groundfish species, including sport fishery and subsistence catches, as well as by directed commercial fisheries.

Objective 3 - The Council will manage the fisheries to minimize waste by:

- (a) Developing approaches to treating bycatches other than as a prohibited species. Any system adopted must address the problems of covert targeting and enforcement.

(b) Developing management measures that encourage the use of gear and fishing techniques that minimize discards.

Objective 4 - The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic groundfish fishery operations.

Objective 5 - The Council will develop measures to control effort in a fishery, including systems to convert the common property resource to private property, but only when requested to do so by the industry.

Objective 6 - Rebuilding stocks to commercial or historic levels will be undertaken only if benefits to the United States can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.

Objective 7 - Population thresholds will be established for economically viable species or species complexes under Council management on the basis of the best scientific information, and ABCs will be established as defined in this document. If population estimates drop below these thresholds, acceptable biological catch (ABC) will be set to reflect necessary rebuilding as determined in Objective 6.

In the remainder of this chapter we examine the management implications of this set of goals and objectives. This examination is important from two perspectives: (1) as a change in the FMP itself; and (2) as a new "yardstick" against which all management alternatives are evaluated.

The most significant point of departure for the revised goals and objectives is the adoption of one overriding goal--that of maximization of economic benefits from management of the groundfish resources of the Gulf of Alaska. Although maximization of economic benefits is part of the National Standards its adoption as the principal management goal is new. This directive as the primary goal for management of Gulf groundfish resources does not negate or reduce the resource stewardship responsibilities of the Council and that management actions must be consistent with the welfare of all living marine resources.

The seven objectives proposed by the work group serve to focus the overall management goal on particular problems. Objectives 1 and 2, taken together, imply that the Council will account for all groundfish fishing mortality and that the Council will establish harvest guidelines for all catch in the fisheries under Council control. Adopting this objective requires a catch accounting scheme which considers both target catch and bycatch. That part of Objective 2 which states that the Council will account for fisheries removals from the sport fishery and from subsistence fisheries will be difficult to implement as estimates of these sources of mortality are currently unavailable.

Minimizing waste by avoiding the prohibited species approach (Objective 3) will be difficult given the current management situation. First, the absence of fishery observers on fully domestic fishing vessels complicates inseason accounting of catch discarded at sea and limits the ability to control targeting on valuable fully utilized species should the retention of fish be allowed. Second, it is the current interpretation of NOAA General Counsel

that domestic fisheries cannot be shut down while any retainable bycatch amounts remain in the joint venture or foreign fisheries. Thus, any measures which the Council can put in place to limit the incidental harvest of fully utilized species may not be enforceable for the wholly domestic fisheries, at least from the NMFS perspective.

Managing to stimulate development of fully domestic groundfish fisheries (Objective 4) can be accomplished, in part, by the frameworked catch accounting procedures presented as alternatives to problems 1 through 3; however, the alternatives listed do not explicitly give priority to developing fisheries.

Objective 5 simply states that the Council will not adopt any procedure which converts the common property resource to private property unless requested to do so by the industry. This precludes adoption of all limited access systems including limited entry, share quota systems, license ceilings, etc., unless the industry so requests. Such an objective implies that overcapitalization of the fleet may continue to be a problem.

Objectives 6 and 7 are concerned with rebuilding and overfishing. Rebuilding will not take place unless the benefits from that rebuilding outweigh the costs, including costs to other fisheries which harvest the species incidentally (Objective 6). However, if the population of an economically viable species should fall below its threshold rebuilding must take place (Objective 7), and ABC will be set to facilitate that rebuilding. An economically viable species is one where the benefits of rebuilding outweigh the costs. Note that in any case, National Standard 1 prohibits overfishing.

Identification of the threshold level of a population is critical to the definition of overfishing. Unfortunately, given the current precision in the fishery population models, the plan team will be unable to establish any meaningful threshold population point estimates for most, if not all, of the managed groundfish species. This implies that a definition of overfishing related to some probability of long-term negative impacts needs to be developed. The SSC has suggested a definition along these lines for Council consideration.

The proposed solutions to the management problems identified in Chapters 3 through 6 will be examined in light of these proposed management goals and objectives.

## 2.2 A Discussion of Impacts of the Goals and Objectives on the Environment

Environmental impacts under the existing objectives are potentially more adverse than those proposed in Amendment 15. Objectives to minimize wastage and account for all fishing mortality are not emphasized under the status quo as they are under Amendment 15. To the extent that possible overharvesting of groundfish stocks could occur under this alternative causes the status quo to be inferior to Amendment 15. Overharvesting a groundfish species will most likely result in fewer numbers of that species in the ecosystem, at least in the short run. Depending on the role of the particular groundfish species in the system, this may result in the consumption of less prey and/or it may provide less biomass for predators (including marine mammals and birds) in the system. At first, more fish waste material from the harvested species is

discharged into the system by floating and/or shorebased processors until fishing pressure drops as reduced abundance of the target species being overfished forces fishermen to abandon their effort. Actual impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment.

New goals and objectives as part of Amendment 15 are more functional than those now contained in the FMP in providing fishery management policy that promotes the well-being of commercially important stocks in the long run while mitigating adverse social and economic impacts. This policy will encourage measures to reduce wastage of incidentally caught groundfish and other fish species. Rather than discarding incidental catches, they will be retained and processed. Such policy promotes better economic returns in the fishery. With respect to environmental impacts, differences between discarding incidental catches at sea or retaining them are believed to be minimal. However, as discussed above under the status quo alternative, risks of overharvesting a species are likely to be reduced under this alternative. Therefore, this alternative is considered superior to the status quo although, actual impacts are likely insignificant when compared to naturally occurring perturbations that occur in the environment.

### 3.0 DESCRIPTION OF MANAGEMENT PROBLEM 1 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: INABILITY TO EFFICIENTLY ADJUST HARVEST GUIDELINES

This chapter considers three alternatives to the present procedure of establishing an optimum yield for each species or species group in the Gulf of Alaska groundfish complex annually via emergency rule. The alternatives are framework procedures which allow annual adjustment of harvest guidelines within an overall OY range for the Gulf groundfish complex. These alternatives are thus similar to the overall OY framework used in managing the Bering Sea groundfish fisheries. The alternatives satisfy conservation objectives, establish harvest guidelines, and satisfy the Council's proposed management objective to account for all groundfish fishing mortality. Annual changes in harvest guidelines have become expected and routine and it is inappropriate to use emergency rule-making procedures and inefficient to amend the plan annually for anticipated revision of harvest guidelines.

The alternatives presented are thus an accounting stance and as such make no allocation of harvest to specific gear groups (other than that contained in Amendment 14).

#### 3.1 The Management Problem

Under the existing plan, specific optimum yields (OYs) are established for every groundfish species or species group being managed by the plan. Due to changes in stock status, most OYs have to be adjusted on an annual basis. Development of a domestic groundfish fishery and expansion of joint ventures also require considerations in establishing allocations to the domestic and joint venture fleets. Under the current plan actual setting of OYs require a plan amendment and may take 11 months or longer to implement. Emergency action has been required to have the most current OYs in effect when fisheries begin. To provide the administrative flexibility to set quotas on an annual basis, the Council directed the Gulf of Alaska plan team to develop management framework alternatives that would address this problem. In addition, they requested that the new framework measures encompass the Council's Gulf of Alaska revised groundfish management objectives where possible.

Specific OYs place two constraints on fishery management. One is that the amount, species, or area of a harvest guideline can be temporarily adjusted with an emergency rule but cannot otherwise be adjusted without a plan amendment. The other constraint is that DAP, JVP, and TALFF must be defined by species and area and, therefore, the allocation options available are severely limited.

The former constraint has resulted in the plan being amended eight times to adjust harvest guidelines in response to changes in the status of stocks and the other determinants of the appropriate harvest guidelines. It has also resulted in the repeated use of emergency rules to enact harvest guidelines at the beginning of the new fishing year. Emergency rules are intended to be used to implement temporary solutions to unanticipated management problems. Annual adjustments to harvest guidelines are not unanticipated; therefore, it is inappropriate to use emergency rules for such adjustments. The second constraint has not resulted in repeated plan amendments and the associated

emergency rules, but it will prevent the attainment of the plan's proposed principal management goal and Objective 3.

It is assumed that the adoption of Alternative 1, 2, or 3 reduces the cost of adjusting harvest guidelines but does not effect the setting of the actual harvest guidelines. This means that the target quota for a species in 1987 is expected to be the same as the 1987 OY for that species should the plan not be amended. It follows that the magnitude of the problem is determined by the additional administrative cost associated with not having an efficient procedure for adjusting harvest guidelines in response to changes in the fishery.

### 3.2 The Alternatives

The alternatives to the status quo described in some detail and analyzed below are three framework procedures that specify a single OY as a range for the groundfish complex and permit harvest guidelines to be adjusted within the OY range without an emergency rule or amendment.

- A. Do nothing - status quo. Each species or species group has an OY specified. If, in the current fishing year, the level of overall fishing mortality is to change from that level the regulations must be changed by emergency rule and formal plan amendment.
- B. Alternative 1: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels and specify a total allowable catch limit (TAC) for each groundfish fishery on an annual basis. The framework procedure is illustrated in Figure 3.1. The procedure consists of four steps:

- (1) Determining the ABC for each managed species or species group.
- (2) Setting a fishing mortality guideline (FMG) for each species or species group by area as a limit on total fishing mortality, where total fishing mortality for a species consists of removal due to commercial groundfish fisheries that either target on that species (target mortality) or take it as bycatch (bycatch mortality) and removals due to all other fisheries (other fishing mortality). The FMG may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the FMG may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC in the next fishing year.
- (3) Establishing quota measures (TACs) designed to prevent the FMGs from being exceeded.
- (4) Summing TAC (Alternative 1) or post season fishing mortality (TGFM, Alternative 2) for all groundfish excluding nonspecified species to assure that the sum is within the OY range specified in the FMP.

Figure 3.1 Working definitions for use in harvest framework for management of groundfish in the Gulf of Alaska.

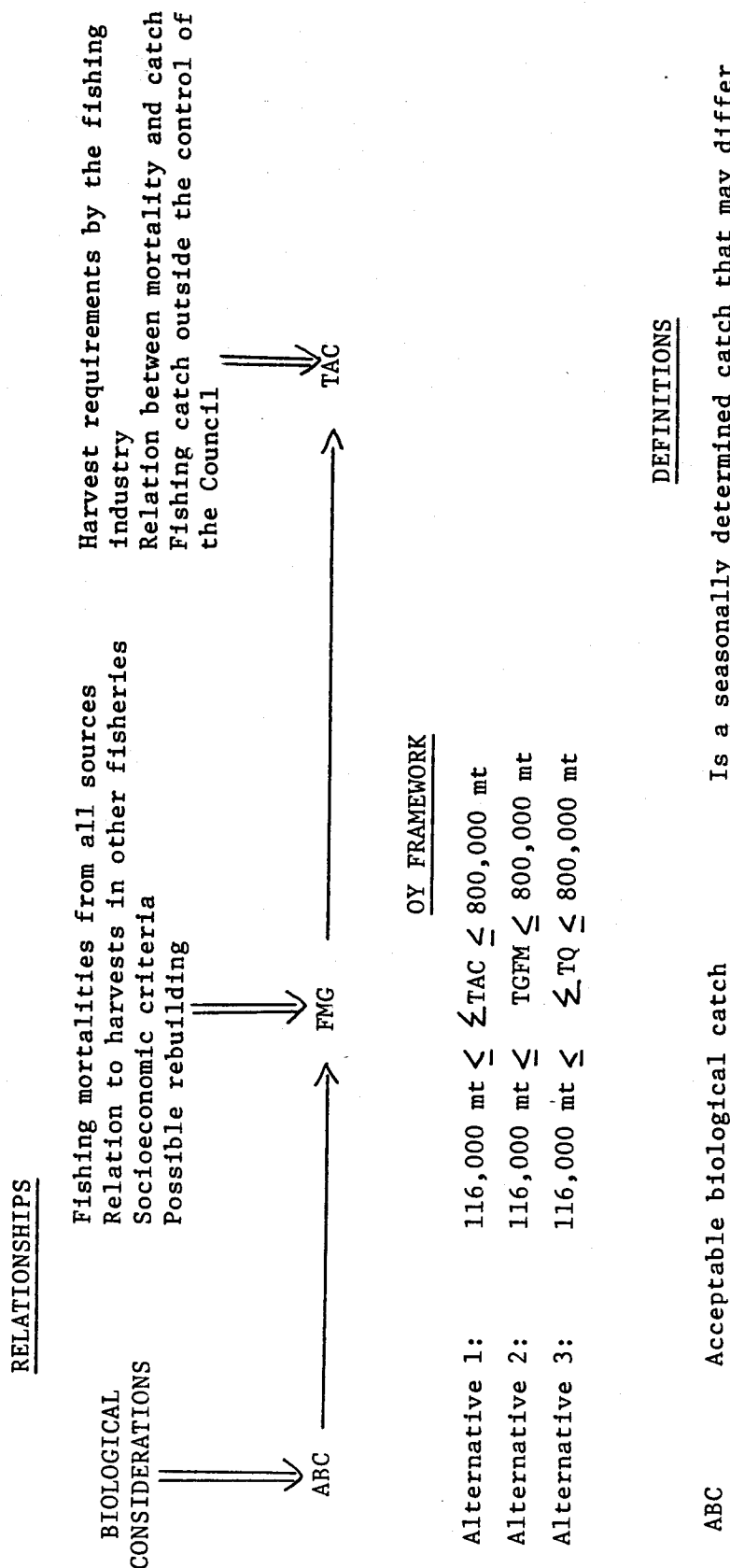


Figure 3.1 continued

FMG	Fisheries mortality guideline	A tolerable fishing mortality--an upper limit placed on the sum of target fishing mortality, bycatch fishing mortality, and fishing mortality on the species from recreational, subsistence, and nongroundfish fisheries. In deriving this estimate the team will consider possible rebuilding, all available estimates of the noncommercial fishery mortality, and the extent that the fishery is part of a mixed species fisheries, that is, the relation of the FMG to all other FMGs. Socioeconomic criteria may also be used. All considerations used in establishing FMG will be presented in the RAD.
PSC	Prohibited species catch	A nonretainable catch. It can take the form of a prohibited or nongroundfish species and/or as a fully utilized groundfish species captured incidentally in groundfish fisheries. Such catch must be recorded and returned to the sea with a minimum of injury. A prohibited species catch limit (PSC) is an apportioned, nonretainable amount of fish provided to a fishery for bycatch purposes. PSC limits of groundfish may be provided to JVP and TALFF when the species is fully utilized by the wholly domestic fishery (i.e., $DAP = TQ$ ).
TAC/TQ	Total allowable catch/Target quota	The harvest quota for a species or species group; the retainable catch. TAC will be apportioned to DAP, JVP, and, possibly, TALFF by area.



Figure 3.1 continued

TGFM	Total groundfish fishing mortality	An administrative concept where a predetermined range (116,000- 800,000 mt) is compared with either
		<ol style="list-style-type: none"><li>1. The sum of the TACs/TQs (Alternatives 1 and 3), or</li><li>2. The TGFM (Alternative 2).</li></ol>
		If (1) or (2) fall in the OY range no plan amendment is necessary and the TACs for the fishing season may be established by rule-related notice.

The range of OY specified in the FMP is 116,000-800,000 mt of groundfish. This range was established by examining for each major groundfish species, historical and recent catches, recent determinations of ABC, and the current and past estimates of MSY (Tables 3.1 and 3.2).

In particular, the end points of the range were derived as described below: For the minimum value, 116,000 mt is approximately equal to the lowest historical groundfish catch during the 21-year period 1965-1985 (116,053 mt in 1971). In that year catches of pollock, Pacific cod and Atka mackerel were all at their minimum value. Given the current status of the groundfish resources and the present management regime, it is considered extremely unlikely that future total harvest will fall below this level. Thus, the TACs/PSCs and FMGs will be established so as to result in a sum of at least 116,000 mt.

The upper end of the OY range, 800,000 mt, was derived from MSY information. The MSY for all species of groundfish (excluding the other species category) has ranged from 804,950 mt in 1983 to 1,000,750 mt for the 1987 fishing year. The average MSY over the five-year period is 845,670 mt. Therefore, the upper end of the range is approximately equal to 95% of the mean MSY for the last recent five-year period. It is possible that in the immediate future, the Council may wish to establish TAC equal to MSY for each species. If this were to occur the Council would be constrained to either keep the sum of TACs at or below 800,000 mt of groundfish, or amend the OY range in the plan.

The ABC summed for all species has ranged from 457,082 mt in 1985 to 720,005 mt in 1984, with an ABC recommended for 1987 of 619,352 mt. The upper end of the OY range is some 29% larger than the 1987 recommended ABC allowing for future expansion in the fishery to that extent.

Most of the variation in the ABC, catch, and MSY over the five-year interval results from changes in the status of two species: pollock and flounder. Pollock ABC has ranged from 113,600 mt in 1987 to 516,600 mt in 1984, a greater than 400,000 mt deviation. Likewise, flounder ABC was 33,500 mt in 1985 and 340,000 mt for 1987, while MSY has gone from 67,000 mt in 1983 to 340,000 mt in 1987. The variation in flounder ABC is therefore approximately 300,000 mt. Therefore, the 800,000 mt upper end of the OY range was selected in consideration of the volatility in pollock and flounder ABC, the potential for harvesting at MSY, and the desire to allow for some moderate expansion in the future flounder fisheries.

- C. Alternative 2: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis. Mortality shall be explicitly accounted for at the end of the fishing year and compared against the OY range.

This alternative is very similar to the procedure described in Alternative 1. The Council will determine a fishing mortality guideline (FMG) for each species or species group being managed by the plan. Under both alternatives total allowable catches (TAC) will be set for the fishing year to prevent the FMGs from being exceeded. The DAP, JVP, and TALFF apportionments are also defined for the Gulf as a whole with specific allocations to each user group by species and area.

Table 3.1 Historical annual groundfish catch in the Gulf of Alaska  
(in metric tons), 1965-1982.

<u>Year</u>	<u>SPECIES</u> <u>Landings, mt</u>						<u>TOTAL</u>
	<u>Pollock</u>	<u>Cod</u>	<u>Sablefish</u>	<u>Rockfish</u>	<u>Flatfish</u>	<u>Atka mackerel</u>	
1965	2,746	583	3,458	382,481	4,697	0	393,965
1966	8,940	459	5,178	148,439	4,928	0	167,944
1967	6,432	2,154	6,143	112,741	4,506	0	131,976
1968	6,168	1,046	15,049	108,594	3,468	0	134,325
1969	17,914	1,357	19,375	79,238	2,676	0	120,560
1970	15,970	1,830	25,694	63,674	3,859	7,281	118,308
1971	9,458	703	25,542	77,985	2,365	0	116,053
1972	34,166	3,572	36,453	77,564	8,942	6,282	166,979
1973	36,989	5,548	27,487	61,414	19,566	9,494	160,498
1974	61,474	5,353	28,006	61,193	9,733	17,531	183,290
1975	53,568	5,985	26,094	58,908	5,487	27,776	177,818
1976	79,526	7,089	27,733	56,983	6,092	15,539	192,962
1977	118,062	2,261	17,135	23,729	16,724	19,455	197,366
1978	97,405	12,167	8,875	10,198	15,180	19,586	163,411
1979	105,783	14,872	10,352	11,489	13,922	10,959	167,377
1980	115,037	35,327	8,509	16,088	15,889	13,166	204,016
1981	147,743	36,086	9,917	18,214	12,532	18,727	243,219
1982	168,746	29,380	8,557	10,731	7,729	6,760	231,903

Sources: Lynde, Marcelle. 1986. The historical annotated landings database documentation of annual harvest of groundfish from the Northeast Pacific and E. Bering Sea, 1957-1980. NOAA Technical Mem., NMFS F/NWC-103.

PacFIN final annual reports, 1981-1982.

Table 3.2 Gulf of Alaska HSYs, ABCs, and catches for the period 1983-87.

YEAR	Pacific Ocean									Totals,
	Pollock	Pacific Cod	Flounders	Perch	Sablefish	Atka Mackerel	Rockfish	Thornyhead	Squid	All species
1983	MSY	334,000	177,000	67,000	150,000	25,000	10,200	3,750	5,000	804,950
	ABC	256,000	60,000	67,000	25,000	13,000	7,600	3,750	5,000	466,050
	Catch	215,608	36,401	12,260	7,406	9,002	2,001	730	271	295,939
1984	MSY	334,000	177,000	67,000	150,000	25,000	10,200	3,750	5,000	804,950
	ABC	516,600	60,000	67,000	21,875	9,480	7,600	3,750	5,000	720,005
	Catch	306,610	22,848	6,112	4,325	10,057	1,278	183	95	352,660
1985	MSY	334,000	177,000	67,000	150,000	25,000	10,200	3,750	5,000	804,950
	ABC	321,600	60,000	33,500	11,474	9,480	7,600	3,750	5,000	457,082
	Catch	291,489	14,442	2,157	925	11,887	442	38	12	323,240
1986	MSY	334,000	136,000	141,000	150,000	25,000	10,200	3,750	5,000	812,750
	ABC	116,600	136,000	141,000	10,500	18,800	n/a	n/a	n/a	n/a
	Catch(to date)	57,039	19,117	1,329	538	17,346	1,388	346	8	97,111
1987	MSY	334,000	125,000	340,000	150,000	25,000	10,200	3,750	5,000	1,000,750
	ABC/FHG	113,600	125,000	340,000	3,702	25,000	2,700	3,750	5,000	619,952
STATISTICS										
Range	MSY, min.	334,000	125,000	67,000	150,000	25,000	10,200	3,750	5,000	804,950
	MSY, max.	334,000	177,000	340,000	150,000	25,000	10,200	3,750	5,000	1,000,750
	ABC, min.	113,600	60,000	33,500	3,702	9,480	2,700	3,750	5,000	457,082
	ABC, max.	516,600	136,000	340,000	25,000	25,000	7,600	3,750	5,000	720,005
	Catch, min.	215,608	14,442	2,157	925	9,002	442	38	12	295,939
	Catch, max.	306,610	36,401	12,260	7,406	17,346	2,001	730	271	352,660
Mean	MSY	334,000	158,400	136,400	150,000	25,000	10,200	3,750	5,000	845,670
	ABC	264,880	88,200	129,700	14,510	15,152	6,375	3,750	5,000	565,622
	Catch(83-85)	271,236	24,564	5,485	3,299	12,073	1,277	324	97	267,238
Std. error	MSY	0	10,306	47,296	0	0	0	0	0	34,703
	ABC	66,793	15,524	19,587	3,501	2,678	1,061	0	0	55,009
	Catch(83-85)	22,988	5,223	2,400	1,528	688	368	172	62	13,372

Source: PacFIN and Gulf of Alaska plan team reports, 1982-86.

Alternative 2 differs from Alternative 1 by explicitly accounting for all groundfish fishing mortality at the end of the fishing year. Under Alternative 1 predictions of fishing mortality are used in setting quotas with the sum of TACs (which itself is a predicted retainable harvest) compared to the 116,000-800,000 mt OY range. Alternative 2 uses the same approach in setting quotas, but, at the end of the year mortality is computed for each groundfish species being managed (FM), then summed for all species and areas to produce a total groundfish fishing mortality (TGFM). The TGFM is then compared to the OY range. The average TGFM for each three-year period (the three-year periods would be 1987-89, 1990-92, etc.) shall not exceed the upper end of the OY range, and the measures that are established to control TGFM shall permit TGFM to at least reach the lower end of the OY range. Should in a single year the TGFM exceed the upper end of the OY range, this alternative allows up to two years to subsequently predict future groundfish mortality so that the three-year average remains within the range. If the TGFM falls below the lower end of the range or if the three-year average exceeds the range, the range will require a plan amendment to revise.

With Alternative 1, TACs are estimated before the season starts, and with Alternative 2, all fishing mortality is counted once it has occurred. Since the final accounting is at the end of the fishing year with Alternative 2, the comparison to OY must be for a period longer than one year.

#### The Framework Procedure for Alternative 1 and Alternative 2.

The timing of actions to be taken under Alternative 1 and Alternative 2 in establishing total allowable catch (TAC) and an overall harvest guideline for comparison with the OY range is as follows:

- (1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary ABCs, FMGs, and TACs for all managed groundfish species. TACs will be specified for DAP, JVP, and TALFF. For fully utilized species the harvest amounts specified for JVP and TALFF may be retainable bycatch amounts (TAC) or prohibited species catch limits (PSC). Each TAC or PSC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.
- (2) September Council meeting. Council will approve preliminary TACs and release RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TACs for DAP, JVP, and TALFF. Public comments on the proposed TAC will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TAC limits.

- (6) By January 1 the Secretary will publish rule-related notice of final TAC limits in FEDERAL REGISTER.
- (7) January 1. Annual TAC limits (and PSC limits if specified) take effect for the current fishing year.

The Resource Assessment Document (RAD) will contain the following information:

- (1) Current status of Gulf of Alaska Groundfish resources, by major species or species group.
- (2) Estimates of maximum sustainable yield (MSY) and allowable biological catch (ABC).
- (3) Estimates of groundfish species mortality from nongroundfish fisheries, subsistence fisheries, and recreational fisheries, and the difference between groundfish mortality and catch, if data are available.
- (4) Catch statistics (landings and value) for the current year.
- (5) The projected responses of stocks and the fisheries to alternative levels of fishing mortality.
- (6) Any relevant information relating to changes in groundfish markets.
- (7) Plan team recommendations for fishery mortality guidelines (FMG) and total allowable catch (TAC) by species or species group and area.
- (8) Any other biological, economic, or biological information which may be useful in establishing FMGs, TACs, and PSCs.

The Council will use:

- (1) recommendations of the plan team and SSC and information presented by the PT and SSC in support of these recommendations;
- (2) information presented by the AP and the public; and
- (3) other relevant information,

to develop its own preliminary recommendations.

- D. Alternative 3: Establish an overall harvest framework procedure which establishes an OY range and provides a procedure for adjusting individual target quotas (TQ) and prohibited species catch limits (PSC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels by specifying a target quota (TQ) for each groundfish fishery on an annual basis. The procedure consists of four steps:

- (1) Determining the ABC for each managed species or species group.

- (2) Determining a TQ based on biological and socioeconomic information. The TQ may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the TQ may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC.
- (3) Identify what groundfish species will be fully utilized by the wholly domestic fishery. Determine a PSC limit in these fully utilized fisheries based on biological and socioeconomic information for joint venture and foreign fisheries. The sum of TQ and PSC for any groundfish species cannot result in overfishing.
- (4) Sum TQ for all groundfish species excluding nonspecified species to assure that the sum is within the OY range specified in the FMP. If the sum falls outside this range the TQs must be adjusted or the plan amended.

The timing of actions and procedure to be taken in establishing target quotas (TQs) is very similar to the schedule described under Alternatives 1 and 2:

- (1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary ABCs, and initial TQs for all managed groundfish species. TQ will be specified for DAP, JVP, and TALFF. For fully utilized species (where DAP = TQ), there will be no retainable catch available for JVP and TALFF. Each TQ may be apportioned among the regulatory areas and districts of the Gulf of Alaska.
- (2) September Council meeting. Council will approve preliminary TQs and release RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TQs for DAP, JVP, and TALFF. Public comments on the proposed TQs will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TQ limits. Final TQs are added to assure that the sum is within the OY range.
- (6) By January 1 the Secretary will publish a rule-related notice of final TQ limits in FEDERAL REGISTER.
- (7) January 1. Annual TQ limits take effect for the current fishing year.

The OY range specified under Alternative 3 is the same as described previously under the other alternatives; or 116,000-800,000 mt of groundfish. The TQs will be summed with the total compared to the OY range. If the sum falls

within the range, the Regional Director will implement the TQs. Should the sum fall outside the OY range, the Council must either adjust the TQs or amend the range in the FMP.

This alternative provides a specific procedure for the setting of bycatch limits of fully utilized groundfish species (i.e., DAP = TQ). Incidental catches of these species will be treated as "prohibited species", where such catch is nonretainable, must be recorded and returned to the sea with a minimum of injury. The timing of actions and procedure to be taken in establishing prohibited species catch limits (PSCs) of fully utilized species is as follows:

- (1) September. Following the initial determination of TQs for all managed groundfish species as described in Section 6.1, the plan team will identify those groundfish species that are fully utilized by the wholly domestic fishery. For those species, initial PSC limits will be calculated for joint venture and foreign fisheries using the best available bycatch rates obtained by NMFS observers from the respective fisheries and applying it to initial joint venture (JVP) and foreign (TALFF) TQ apportionments. Each PSC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.
- (2) September Council meeting. Council will review and approve preliminary PSCs and RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed PSCs for JVP and TALFF. Public comments on the proposed PSCs will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan Team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual PSC limits.
- (6) By January 1 the Secretary will publish a rule-related of final PSC limits in the FEDERAL REGISTER.
- (7) January 1. Annual PSC Limits take effect for the current fishing year.

For purposes of supplying scientific information to the Council for use in utilizing the above procedure, a RAD will be prepared annually as similarly described for Alternatives 1 and 2.

As with the status quo, a reserve system is used whereby 20% of each species or species group TQ is initially set aside for purposes of accommodating expanding DAP and JVP fisheries. The Regional Director may access DAP or JVP and apportion to them any amounts of reserves that he finds will be harvested by U.S. vessels. The Regional Director may apportion to TALFF any portion of the reserves that he determines will not be harvested by U.S. vessels.



It should be noted that with Alternatives 1, 2 and 3 the attainment of a TAC/TQ for a species is intended to close the target fishery for a species. That is, once the quota is taken further retention of that species would be prohibited. Other fisheries targeting on other species would be allowed to continue as long as the nonretainable bycatch of the closed species is found to be nondetrimental to that stock (status quo). Similarly, when a groundfish PSC limit is reached the applicable fishery must close, regardless if its target quota has been harvested.

With the exception of the "other species" management category, the framework procedure described above is used to determine TACs or TQs for every groundfish species and species group managed by the plan. Groundfish that support their own fishery, and for which a sufficient data base exists that allows each to be managed on the basis of its own biological, social, economic, and ecological merits, are called "target species". Groundfish species that are not specified as a target species are collectively grouped in the "other species" category. These species currently are of slight economic value and are generally not targeted upon. This category, however, contains species with economic potential or which have importance to the ecosystem, but which lack sufficient data to allow separate management. Accordingly, a single TAC/TQ, equal to 5% of the combined TACs/TQs for target species shall apply to this category. Records of catch of this category must be maintained.

All remaining species of fish and invertebrates taken incidentally that are not managed by other FMPs and are associated with groundfish fisheries, are designated as "nonspecified species" and catch records need not be kept.

### 3.3 Environmental Impacts of the Alternatives

#### A. Do nothing - status quo alternative.

Under the status quo alternative, underharvesting or overharvesting groundfish stocks technically could occur if fisheries were closed only on the basis of quotas specified in the regulations. For instance, a quota may be lower than an amount that would otherwise be acceptable, but current regulations would require the fishery to be closed, which would result in underharvesting a stock. Or a quota may be higher than an amount that a stock would support, but current regulations would allow the fishery to continue, which would result in overharvesting a stock, unless it were closed by some other means. The effects of underharvesting groundfish stocks would result in larger numbers of groundfish species remaining in the ecosystem. More groundfish, therefore, would be in the system to prey on other fish and invertebrates. In turn, more groundfish would be available to be preyed on by marine predators, including marine mammals and birds. Predator/prey relations could change, depending on the importance of the underharvested species as a predator or a prey. Less nutrients in the form of processing wastes would be dumped into the system to be consumed by various marine life as a result of less fishing activity. The effects of overharvesting groundfish stocks would result in smaller numbers of a groundfish species remaining in the ecosystem. Fewer groundfish, therefore, would be in the system to prey on other fish and invertebrates. In turn, fewer groundfish would be available to be preyed on by marine predators, including marine mammals and birds. Again, predator/prey relations could change, depending on the importance of the overharvested species as a predator or a prey. Initially, more nutrients in the form of

processing wastes would be dumped into the system to be consumed by various marine life as a result of fishing activity. Eventually, fishing would cease when fishermen were not able to receive a reasonable economic return from the overexploited species. Actual environmental impacts on the ecosystem are difficult to measure but are believed to be insignificant when compared with natural perturbations in the system.

Under current regulations, species for which the quota has been reached must be treated as prohibited species and discarded at sea while harvesting other groundfish species for which a quota remains. However, such continued fishing would be unlawful should further incidental catches of the fully harvested groundfish species cause that species to be overfished within the meaning of the national standard guidelines. The Secretary must make a finding that overfishing shall not occur before he allows other target fisheries to continue. Because the additional mortality suffered by such prohibited species would not be accounted for, overharvesting of that species is possible. Again, such impacts are believed to be insignificant when compared with natural perturbations in the system.

#### B. Alternative 1.

Alternative 1 is superior to the status quo alternative, because quotas may be adjusted efficiently on an annual basis using a rule-related notice procedure rather than a plan amendment. Both retainable and/or nonretainable quotas (TACs, PSCs) may be specified for each species being managed by the plan. Compared to the status quo alternative, the authority to provide "buffer" amounts of all species including sablefish will tend to prevent exceeding the FMG estimates for groundfish, thereby reducing the risk of overharvesting while still providing reasonable amounts of groundfish for bycatch purposes. Amounts of nutrients from fish wastes dumped into the sea from processing operations would be less than would occur due to overharvesting a species.

Actual environmental impacts on the ecosystem are difficult to measure but are believed to be insignificant when compared with natural perturbations in the system. Environmental impacts as a result of commercial harvests will be the same as the status quo. Fishermen will continue their attempts to achieve quotas. However, this alternative requires that an accounting of all fishery related mortality upon groundfish species be conducted annually and that this information be used in decision making. Managers will now have a better overall view of the ecosystem which will lead to better management decisions. The framework also requires that the intended retainable catches (TACs) for the Gulf groundfish complex as a whole be compared to an historical OY range for purposes of management evaluation. To the extent that preventing overharvesting of any species prevents overfishing of that species within the meaning of the national standard guidelines, this alternative is considered superior to the status quo alternative.

Also, this alternative provides the mechanism for an accounting of groundfish mortality and catches. Estimates of mortality attributed to directed and incidental catches of groundfish will be taken into account when evaluating status of stocks information and setting quotas. As a result, managers will be more knowledgeable of the environmental impacts of fisheries in the Gulf of Alaska and will be required to consider mortality estimates when developing management programs. Such management will decrease the probability of overharvesting groundfish resources in the Gulf of Alaska.

C. Alternative 2.

Alternative 2 shares all the environmental benefits described above as well as provide more accurate fishing mortality estimates and TAC/OY evaluations. It is more accurate because in addition to the preseason setting of harvest and bycatch quotas, the framework requires a postseason review of actual harvests and estimated mortality. The postseason estimates of TAC, PSC and FMG lead to a total groundfish fishing mortality estimate (TGFM) for the Gulf groundfish complex as a whole, which is then compared to the specified OY range. Alternative 2 differs from Alternative 1 in that actual mortality, as opposed to predicted catches are formally used in the OY comparison and in preseason adjustments of harvest quotas in subsequent years. Since this framework requires a review after fishing has occurred, should the Council discover that the TGFM exceeded the upper end of the OY range, a three year provision is provided to allow the Council to ensure that the average fishing mortality over the three years does not exceed the OY range. For completeness, this three-year provision is considered important to the framework since it is likely that on occasion actual harvests and mortality will exceed the preseason TACs and FMGs set by the Council. However, with the proposed OY range it is doubtful the the upper end will be exceeded. This alternative is superior to the status quo alternative to the extent that preventing overharvesting of any species prevents overfishing.

D. Alternative 3.

Alternative 3 is superior to the status quo alternative, because quotas may be adjusted efficiently on an annual basis using a rule-related notice procedure rather than a plan amendment. Retainable quotas (TQs) may be specified for each species being managed by the plan. In addition, nonretainable quotas (PSCs) may be specified for joint venture and foreign fisheries for those fisheries that are fully utilized by wholly domestic fisheries (DAP). This more efficient procedure could lessen chances of over or underharvesting.

Actual environmental impacts on the ecosystem are difficult to measure but are believed to be insignificant when compared with natural perturbations in the system. Environmental impacts as a result of commercial harvests will be the same as the status quo. Fishermen will continue their attempts to achieve quotas. The framework also requires that the intended retainable catches (TQs) for the Gulf groundfish complex as a whole be compared to an historical OY range for purposes of management evaluation. To the extent that preventing overharvesting of any species prevents overfishing of that species within the meaning of the national standard guidelines, this alternative is considered superior to the status quo alternative.

#### 4.0 DESCRIPTION OF MANAGEMENT PROBLEM 2 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: INADEQUATE REPORTING REQUIREMENTS.

##### 4.1 The Management Problem

Current reporting requirements are of two types. First, operators of any fishing vessel are responsible for the submission to the Alaska Department of Fish and Game of an accurately completed State of Alaska fish ticket for each sale or delivery of groundfish caught in any regulatory area. Second, operators of any catcher/processor and mothership vessel that freezes or dry-salts any part of its catch on board that vessel and retains that fish at sea for a period of more than 14 days from the time it is caught, or which receives groundfish at sea from a domestic fishing vessel and retains that catch for a period of more than 14 days from the time it is received, must submit to the Regional Director, Alaska Region, NMFS a weekly catch or receipt report for each weekly period, Sunday through Saturday during which groundfish were caught or received at sea.

This latter requirement was necessary to aid management agencies in the inseason monitoring of groundfish catches. More timely catch and effort information was needed because large catches onboard catcher/processor and mothership vessels were not being reported for weeks or months through the normal fish ticket submission process. Without timely reporting, management agencies risked closing fisheries based on incomplete and unsatisfactory information that might cause either under- or over-harvesting of groundfish stocks.

One year's experience with the catcher/processor and mothership reporting system has revealed certain problems that reduce the effectiveness of the weekly reporting system. The most critical problem is the exemption from the weekly reporting requirement granted any vessel that lands its catch within 14 days. When a vessel which has been reporting weekly stops reporting or omits a report during one or more weekly periods because it was landed within a 14-day period, three problems are created. First, the absence of weekly catch reports for certain periods and vessels results in an incomplete accounting of catches for that segment of the fleet, which has led to inaccurate forecasts of quota achievement. The catch data submitted on fish tickets by catcher/processors and motherships often enter the management system too late to be useful for filling these data gaps in real time. Second, the reconciliation of fish tickets with weekly catch reports, where reporting periods often overlap, has resulted in significant delays in compiling catch information due to the time spent resolving discrepancies in the data. The most common and serious discrepancy experienced to date has been double counting of catch, which has resulted in premature forecasts of quota achievement. Finally, inseason enforcement of the weekly reporting requirements has been rendered nearly impossible. When a vessel which has been reporting weekly stops reporting or skips one or more periods, enforcement agents are unable to act because of the possibility that the vessel lawfully reported by fish ticket.

#### 4.2 The Alternatives

##### A. Do nothing - status quo alternative.

Vessels currently are required to report their landings via fish tickets to the Alaska Department of Fish and Game. Catcher/processor and mothership/processor vessels (defined as those vessels that salt or freeze their catch at sea) are required to file weekly reports with NMFS if their trip length exceeds 14 days. Those catcher/processors that land fish in 14 days or less are not required to submit a report to the Regional Director but must report to the Alaska Department of Fish and Game within seven days.

##### B. Alternative 1.

Under this alternative, any vessel that prepares fish to render it suitable for human consumption for use on board that vessel would be required to report its catches regardless of how many days there are between landings. Any vessel that receives fish from a catcher vessel and retains it at sea for any time period, would be required to report amounts of fish received from each catcher vessel. Reports would be required for each Sunday through Saturday period. The reports would be required even though that vessel had reported its catch through the State of Alaska's fish ticket system. This alternative would make inseason management of the fisheries more effective by: (1) eliminating time needed to resolve fish ticket discrepancies resulting from double counting, and (2) eliminating time lost due to delays in receiving fish ticket data. Inseason catches by catcher/processor vessels and catches received by mothership/processor vessels would be tabulated from just one source--the weekly report. Ease of monitoring the fishery inseason would increase and management decisions made during the course of the fisheries would be more accurate.

#### 4.3 Environmental Impacts of the Alternatives

##### A. Do nothing - status quo alternative.

Under the status quo alternative, operators of at-sea processing vessels would only be required to report if they did not make deliveries within 14 days or less. Inseason management would continue to be jeopardized by double accounting of catches. Management decisions made to open or close fisheries may be made erroneously, resulting in possible under or overharvesting of groundfish stocks. In some fisheries which proceed rapidly, e.g., the hook and line fishery for sablefish, real time management would be jeopardized if large quantities of fish that at-sea processor vessels may have on board are not reported timely. Recent experience has shown that the sablefish hook and line fleet can harvest 200 mt or more per day. If only a few hundred tons are left in a quota, then the risk of overharvesting a quota is increased. As a result of overharvesting the quota, the predator/prey relationship in the food web might be more disturbed as a result of increased fishery-related disturbances on the environment, because the numbers of sablefish remaining in the system would be farther from an equilibrium (assuming it was) with those other predator and prey species remaining in the ecosystem. Fewer numbers of other living marine species would be preyed on by the groundfish species remaining in the system. In turn, fewer numbers of the groundfish species would be preyed on by other predators. Overharvesting groundfish species would

initially result in greater net loss of nutrients from the system although increased amounts of nutrients from processing waste would be locally introduced. Eventually smaller amounts of nutrients would be introduced as fishing slows when fishermen are no longer able to make a reasonable return from the fishery. These impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment. To avoid overharvesting a stock, managers may close a fishery on the basis of estimates that result in substantial underharvests. Underharvesting the quota would also disturb the predator/prey relationship in the food web because the numbers of groundfish remaining in the system would be further from equilibrium (assuming it was) with other elements of the ecosystem. Larger numbers of other living marine species would be preyed on by the groundfish species remaining in the system. In turn, larger numbers of the groundfish species would be preyed on by other predators.

#### B. Alternative 1.

Under Alternative 1, operators of catcher/processor vessels would be required to report their catches regardless of the number of days they had fished. Operators of other at-sea processing vessels would be required to report amounts of fish received from each catcher vessel. Reports would be for each Sunday through Saturday period. This alternative is superior to the status quo alternative, because inseason management would no longer be jeopardized by double accounting of catches. Management decisions to open or close fisheries would be made on the best available data. Risks of under or overharvesting groundfish stocks and the associated impacts of such actions described above for the status quo alternative could be reduced.

## 5.0 DESCRIPTION OF MANAGEMENT PROBLEM 3 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: KING CRAB BYCATCH IN KODIAK NONPELAGIC TRAWL GROUND FISH FISHERIES

### 5.1 The Management Problem

The number of red king crab in the waters around Kodiak Island are at historically low levels, with most being old, sexually mature animals. There has been no sign of significant recruitment in seven years. As a result, the Kodiak commercial king crab fishery has been closed since 1983 in an attempt to rebuild the stocks. During this same period a developing domestic groundfish fishery using a variety of gear has displaced most foreign fisheries. While the cause for the decline of king crab is not known, most researchers believe that the decline can be attributed to a variety of environmental factors which independently or in combination led to the depressed condition of the resource. Whether the king crab decline is due in part to commercial fishing, either directed or incidental, is unknown.

King crab are known to concentrate in certain areas around Kodiak Island during the year. In the spring they migrate inshore to molt and mate. Approximately 70% of the female red king crab stocks are estimated to congregate in two areas, known as the Alitak/Towers and Marmot Flats. The Chirikof Island and Barnabas areas also possess concentrations of king crab but in lesser amounts. Past studies have shown that most king crab around Kodiak mate and molt in the March-May period, although some molting crab can be found during late-January through mid-June. Adult female king crabs must molt to mate and extrude eggs. After molting, their exoskeleton (shell) is soft, and crabs in this stage are known as soft-shell crabs. The new exoskeletons take 2-3 months to harden fully. During the soft-shell period, the crabs are particularly susceptible to injury and mortality from handling and from encounters with fishing gear. Because many of the present and potential groundfish trawling grounds overlap with the mating grounds of king crab, the potential exists for substantial king crab mortality.

While it is generally assumed that king crab mortality during the soft-shell phase can be high with any gear type, incidental mortality of hard-shell crab as a result of encounters with fishing gear is not known. Trawl fishing could kill or injure king crab in two ways. First, crabs caught in the net can be crushed during the tow or injured as the catch is unloaded in the fishing vessel. Recent observer studies estimate that about 70% of the crabs caught by non-pelagic (or bottom) trawls in the Bering Sea are killed. Second, crabs might be struck with parts of the gear (e.g., trawl doors, towing cables, groundlines, roller gear) as the trawl is towed along the bottom.

In January 1986, the Council approved an emergency rule to close specified areas around Kodiak Island to non-pelagic trawling while king crab were in their soft-shell condition. This action was believed necessary due to the severely depressed Kodiak king crab stocks. The stocks have experienced little or no recruitment in recent years, and are likely subject to high mortalities to bottom trawls while in the soft shell condition. The emergency rule expired on June 15, 1986, when the soft shell period is believed to end. The Council action was intended to help rebuild the Kodiak king crab resource while still providing non-pelagic trawl opportunities for groundfish fishermen. The action was to be an interim measure until a longer-term solution could be developed.

In an attempt to allow industry to negotiate a solution to its problems, an industry workgroup was assembled at the request of the Council to review recent actions taken by federal and state management agencies and to develop a long-term solution that would meet the needs of all interested fishing industry groups. Supporting the workgroup were fishery scientists and managers who presented the latest biological and fishery information on the status of the king crab stocks and on areas where commercial fishing operations for groundfish, crab and shrimp are conducted. The workgroup developed a management alternative which is described under Alternative 1.

## 5.2 The Alternatives

### A. Do nothing - status quo.

Under this option, there would be no specific control of king crab bycatch in the Gulf of Alaska groundfish fisheries. The PSC framework for halibut established by Amendment 14 remains in effect (50 CFR 672.20e). The retention of halibut, salmon, and king and Tanner crab, are prohibited in all domestic, joint venture, and foreign groundfish fisheries.

### B. Alternative 1: Establish a time/area closure scheme for non-pelagic trawling to help rebuild the Kodiak king crab resource for a period of three years from the year of implementation (Figure 5.1 and Table 5.1).

This alternative was developed by the industry workgroup and proposes establishing an area designation system with specific time/area closures. The area designations and management actions are as follows:

Table 5.1 Definitions of King Crab Bycatch Areas

<u>Area Type</u>	<u>Name and Definition</u>
I	Type I areas are those king crab stock rebuilding areas where a high level of protection to king crab will be provided by closing the area year-round to non-pelagic trawling. Fishing with other gear would be allowed.
II	Type II areas are those areas sensitive for king crab populations and in which bottom trawling will be prohibited during the soft-shell season, Feb 15 - Jun 15. Fishing with other gear would be allowed and fishing with non-pelagic trawl gear would be allowed from Jan 1 - Feb 14 and Jun 16 - Dec 31.

Areas designated as either Type I or II are shown in Figures 5.1 and 5.2.

In developing this alternative, the industry workgroup recognized that the future of the king crab resource is dependent on the ability of existing brood stock to successfully produce crab. Scientific data shows that Alternative 1 provides protection to 85% of the Kodiak red king crab stocks, protects the most highly concentrated crab areas all year round, yet provides for groundfish fishing opportunities necessary to support the economic base of Kodiak communities. The workgroup also recognizes that once areas have been



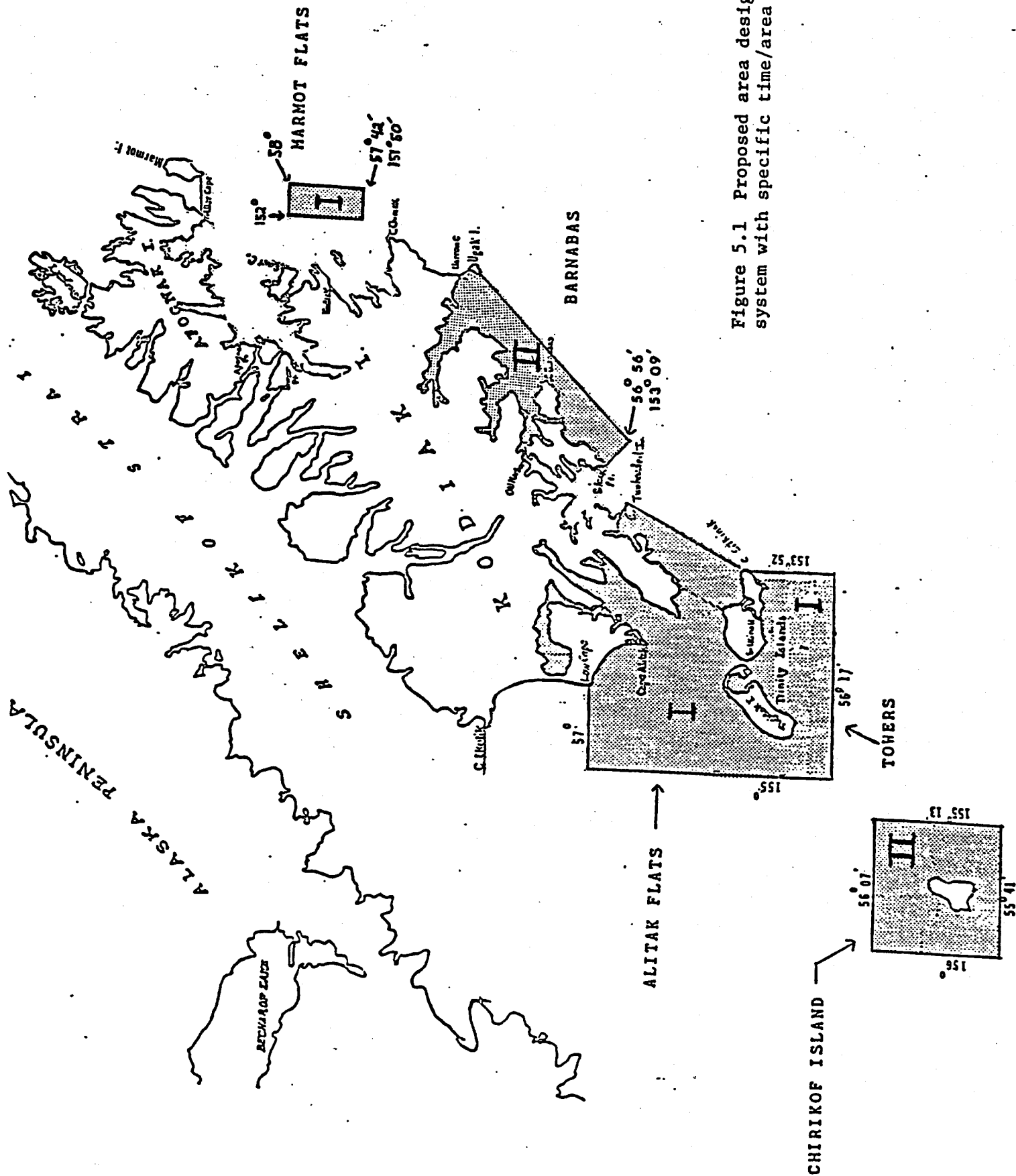


Figure 5.1 Proposed area designation system with specific time/area closures.

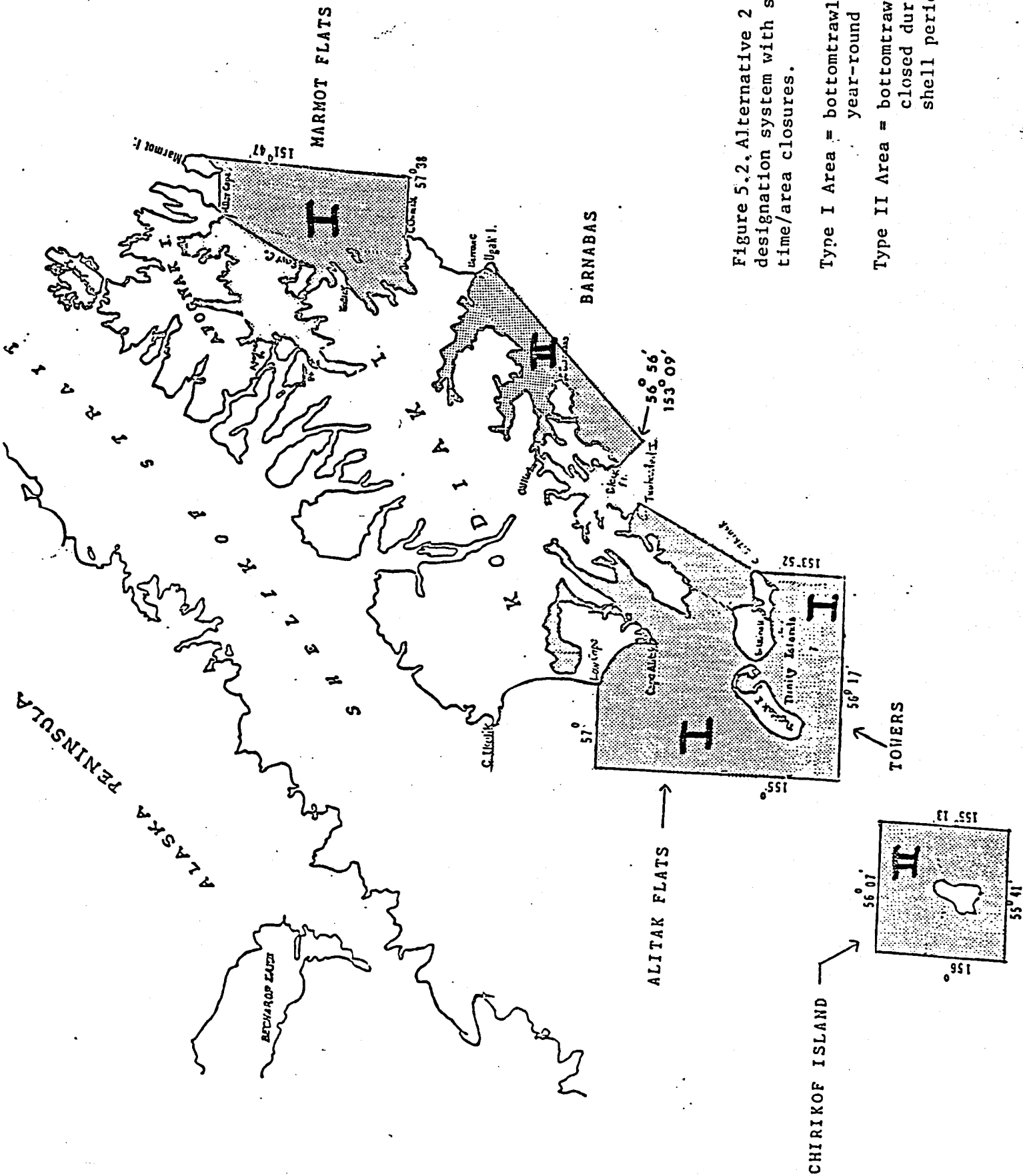


Figure 5.2, Alternative 2 area designation system with specific time/area closures.

Type I Area = bottomtrawling closed year-round  
 Type II Area = bottomtrawling closed during soft-shell period

closed to fishing, there is often a reluctance to open those areas even when circumstances may have changed. Therefore, the time/area closure scheme presented in Alternative 1 will be in effect for three years from the year of implementation. At that time the Council will review the situation, the status of the king crab resource, the apparent effectiveness of the time/area closures, etc. to determine whether this approach to the king crab bycatch problem should be continued, abandoned, or replaced with a new alternative.

It should be noted that if the state of Alaska finds reason to open a shrimp fishery within the designated areas, these alternatives are not intended to prohibit such a shrimp opening.

- C. Alternative 2: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 1 except that a larger area of Marmot Flats is designated a Type I area. This scheme is designed to help rebuild the king crab resource and would be in effect for three years from the year of implementation (Figure 5.2).

This alternative is identical to Alternative 1 with the exception that the Marmot Flats area is expanded to match the boundaries defined by the Council's 1986 emergency rule (Figure 5.2). As with Alternative 1, the Marmot Flats, Alitak Flats, and Towers areas would be designated Type I areas and closed year-round to non-pelagic trawling for groundfish. Similarly, the Chirikof and Barnabas areas are designated as Type II areas with non-pelagic trawling prohibited during the February 15 - June 15 king crab soft-shell period. Fishing with other gear would be allowed and fishing with bottom trawl gear would be allowed from January 1 - February 14 and June 16 - December 31. This alternative was developed for public review by the Advisory Panel.

- D. Alternative 3: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 2 except that a smaller part of the Marmot Flats area is designated a Type I area, as shown in Figure 5.3 and Table 5.1, for a period of three years from the year of implementation.

This alternative is identical to Alternative 2 with the exception that the Marmot Flats area is reduced to match the boundaries specified by the Council's Advisory Panel at their meeting on September 23, 1986 (Figure 5.3). As in Alternative 1, the Marmot Flats, Alitak Flats and Towers areas would be designated Type I areas and the Chirikof and Barnabas areas designated as Type II areas.

### 5.3 Environmental Impacts of the Alternatives

- A. Do nothing - status quo alternative.

With this option, no specific management measure would be implemented in this plan for the control of king crab bycatch in the non-pelagic trawl groundfish fisheries. Incidental catches and subsequent mortalities would continue wherever concentrations of king crab occur, and at all times of the year when non-pelagic trawling is conducted. This alternative does not afford any protection to the king crab resource nor does it address the needs described in the problem statement. The condition of king crab likely would remain

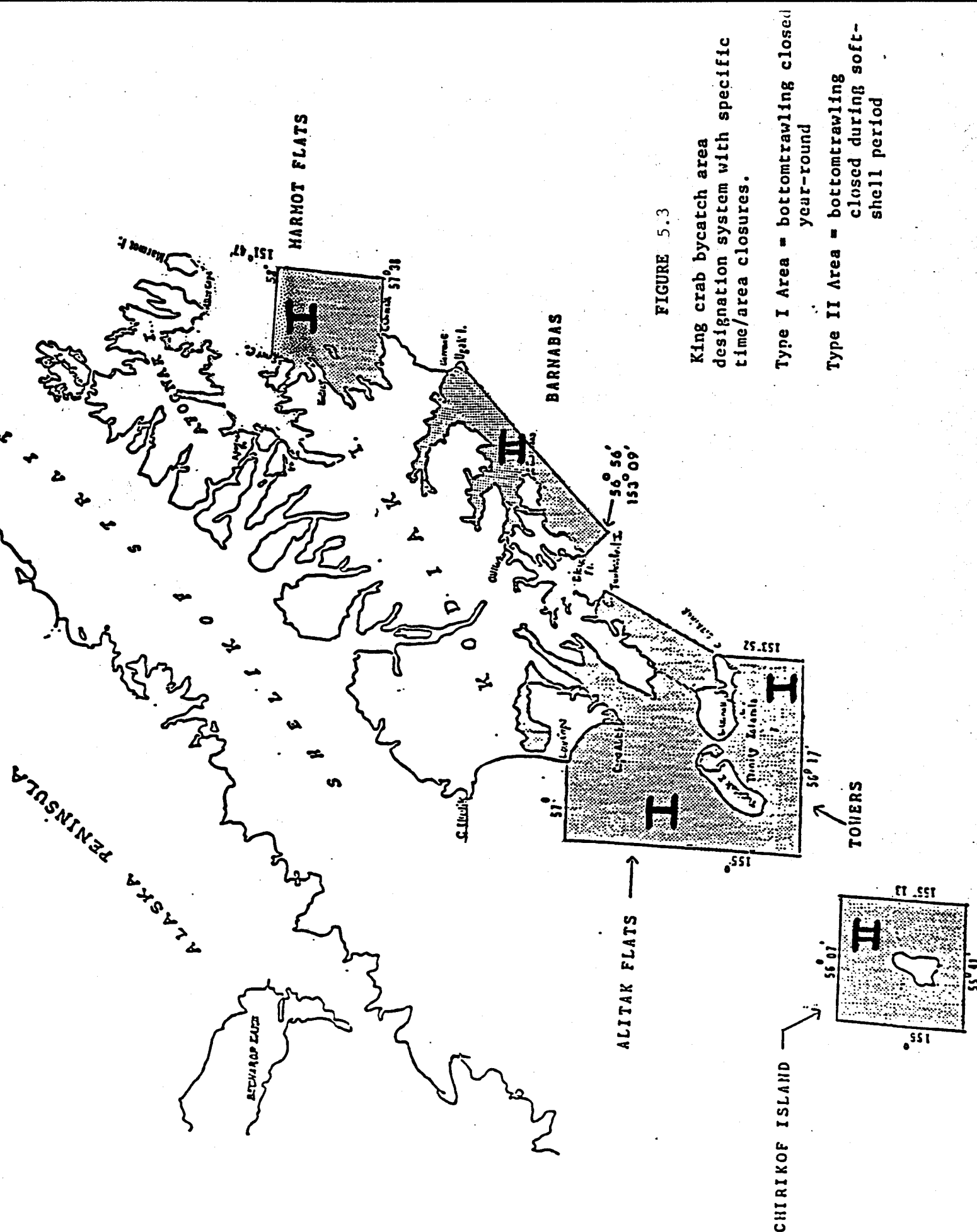


FIGURE 5.3

King crab bycatch area designation system with specific time/area closures.

Type I Area = bottomtrawling closed year-round

Type II Area = bottomtrawling closed during soft-shell period

depressed. Fewer king crab in the system would be present as a prey species for predators. Known predators include halibut, Pacific cod, and sculpins that feed on juvenile king crab; herring and capelin feed on larval king crab.

Predators also include marine mammals. Interaction between king crab and marine mammals is generally minimal. Exceptions are interactions with sea otters. The sea otter feeds on any size of king crab, including commercial sized crab. The sea otter is also a benthic feeder and regularly dive to 30 fathoms in search of food and have been recorded at depths as great as 50 fathoms. A potential exists for conflict between crab fishermen and sea otters when crab pots are set in relatively shallow water near shore, because sea otters may enter crab pots and drown. The occurrence of such sea otter mortality is believed to be rare. No documentation exists on the importance of king crab in the sea otter diet.

Also under this alternative, fewer king crab would be in the system to feed on other marine life. King crab are bottom foragers, feeding on a wide range of food items, including dead organisms. Crab larvae feed on sponges, hydroids, and algae during the transition to their demersal mode of life. Brittle stars are an important food item for newly molted king crab. King crab also feed on mollusks, polychaete worms, isopods, young Tanner crab, other star fish, and sea urchins. With fewer king crab, more of these organisms would be available for consumption by other organisms.

With the status quo, commercial fishing for groundfish would be conducted in the areas proposed to be closed or restricted in Alternatives 1 and 2. Groundfish will thus be removed from the system, which otherwise would have contributed to the current food web in these areas. The predator/prey relationships that exist in local areas and the food web that have adjusted to the low abundance of king crab and current level of groundfish fishing would remain the same. The overall environmental impacts of this alternative compared with Alternatives 1 and 2 are not well understood but are believed to be insignificant. The Gulf of Alaska ecosystem is so complex, that the environmental impacts as a result of this amendment are undetectable given the background availability of the system.

- B. Alternative 1: Establish a time/area closure scheme for non-pelagic trawling to help rebuild the Kodiak king crab resource for a period of three years from the year of implementation.

Adoption of this alternative would provide the positive benefits of protecting the majority (85%) of Kodiak Island king crab resource from non-pelagic trawls during their soft-shell period (February 15-June 15), protect the most concentrated king crab areas (Alitak Flats and Towers), or 70% of the existing resource year round, while still providing non-pelagic trawl fishing opportunities close to established processing and support facilities (Dana Schmidt, ADF&G, personal communication). Injury or mortality as a result of non-pelagic trawling would be reduced.

Compared to the status quo alternative, Alternative 1 would increase the probability of a king crab population recovery while minimizing the impacts on the groundfish non-pelagic trawl industry. A review of 1985 non-pelagic trawl groundfish harvests indicate that only 1% of the harvest would have been lost if the time/area closures had been in effect during that year. It is likely

that the foregone groundfish catch consisting of sablefish, Pacific cod, and flounder would have been taken from other areas around Kodiak Island. Therefore, the impacts of this alternative on groundfish stocks is insignificant.

As king crab stocks recover more king crab will enter the ecosystem. The predator/prey relationship in the closed or restricted areas would change. More king crab would consume prey species that otherwise may have been consumed by other species. In turn, more king crab will be available to be preyed on by other predators, including marine mammals. Local fishing mortality would be reduced as groundfish fishing is closed or restricted. Fewer or no groundfish would thus be removed from the system, which would then contribute to the current food web in these areas. The balanced predator/prey relationships that exist in local areas and the food web that has adjusted to the low abundance of king crab and current level of groundfish fishing would change. The overall environmental impacts of this alternative compared with the status quo alternative are not well understood but are believed to be insignificant compared to natural perturbations in the environment.

- C. Alternative 2: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 1 except that a larger area of Marmot Flats is designated a Type I area. This scheme is designed to help rebuild the king crab resource and would be in effect for three years from the year of implementation (Figure 5.2).

Adoption of this alternative would intuitively afford more protection for king crab because a larger area of Marmot Flats is included in the time/area closure scheme. However, what additional protection is provided is unknown. A review of king crab population survey data does not statistically allow a comparison of the degree of king crab protection between Alternatives 1 and 2. As with Alternative 1, Alternative 2 protects the majority (85%) of Kodiak Island king crab resource from non-pelagic trawls during their soft-shell period (February 15 - June 15), and protects the most concentrated king crab areas (Alitak Flats and Towers), or 70% of the existing resource year-round (Dana Schmidt, ADF&G, personal communication).

As with Alternative 1, this alternative would increase the probability of a king crab population recovery while minimizing the impacts on the groundfish non-pelagic trawl industry. A review of 1985 bottom trawl groundfish harvests indicate that only 1% of the harvest would have been lost if the time/area closures had been in effect during that year. It is likely that the foregone groundfish catch consisting of sablefish, Pacific cod, and flounder would have been taken from other areas around Kodiak Island. Therefore, the impacts of this alternative on groundfish stocks is insignificant.

As king crab stocks recover more king crab will enter the ecosystem. The predator/prey relationship in the closed or restricted areas would change. More king crab would consume prey species that otherwise may have been consumed by other species. In turn, more king crab will be available to be preyed on by other predators, including marine mammals. Local fishing mortality would be reduced as groundfish fishing is closed or restricted. Fewer or no groundfish would thus be removed from the system, which would then contribute to the current food web in these areas. The balanced predator/prey relationships that exist in local areas and the food web that has adjusted to

the low abundance of king crab and current level of groundfish fishing would change. The overall environmental impacts of this alternative compared with the status quo alternative are not well understood but are believed to be insignificant compared to natural perturbations in the environment.

- D. Alternative 3: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 2 except that a smaller part of the Marmot Flats area is designated a Type I area, as shown in Figure 5.3 and Table 5.1, for a period of three years from the year of implementation.

Intuitively, adoption of this alternative provide more protection for king crab than Alternative 1. However, the level of protection this alternative provides relative to the other alternatives is unknown. King crab survey data is not of adequate spatial resolution to address these differences. As in Alternatives 1 and 2, Alternative 3 protects the areas of highest concentrations of king crab (Alitak Flats and Towers), or 70% of the existing resource year-round (Dana Schmidt, ADF&G, personal communication).

As with Alternative 1 and 2, this alternative would increase the probability of a king crab population recovery while minimizing the impacts on the groundfish non-pelagic trawl industry. A review of 1985 bottom trawl groundfish harvests indicate that only 1% of the harvest would have been lost if the time/area closures had been in effect during that year. It is likely that the foregone groundfish catch consisting of sablefish, Pacific cod, and flounder would have been taken from other areas around Kodiak Island. Therefore, the impacts of this alternative on groundfish stocks is insignificant.

As king crab stocks recover more king crab will enter the ecosystem. The predator/prey relationship in the closed or restricted areas would change. More king crab would consume prey species that otherwise may have been consumed by other species. In turn, more king crab will be available to be preyed on by other predators, including marine mammals. Local fishing mortality would be reduced as groundfish fishing is closed or restricted. Fewer or no groundfish would thus be removed from the system, which would then contribute to the current food web in these areas. The balanced predator/prey relationships that exist in local areas and the food web that has adjusted to the low abundance of king crab and current level of groundfish fishing would change. The overall environmental impacts of this alternative compared with the status quo alternative are not well understood but are believed to be insignificant compared to natural perturbations in the environment.

## 6.0 DESCRIPTION OF MANAGEMENT PROBLEM 4 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: INADEQUATE INSEASON MANAGEMENT AUTHORITY

### 6.1 The Management Problem

The Regional Director is currently authorized by the FMP to make inseason time/area adjustments in the Gulf of Alaska groundfish fishery. These adjustments are accomplished by field orders, which are regulations published in the FEDERAL REGISTER. The FMP states that the Regional Director may issue such field orders for conservation reasons only. His adjustments are to be based on the following considerations:

- (1) The effect of overall fishing effort within the area in comparison with preseason expectations.
- (2) Catch per unit of effort and rate of harvest.
- (3) Relative abundance of stocks within the area in comparison with preseason expectations.
- (4) The proportion of halibut or crab being handled.
- (5) General information on the condition of stocks within the area.
- (6) Information pertaining to the optimum yield for stocks within the the statistical area.
- (7) Any other factors necessary for the conservation and management of the groundfish resource.

Except for 4 above, the implementing regulations at 50 CFR Part 672.22 roughly follow the language contained in the FMP. Concerning item 4, the implementing regulation only provides for consideration of the amount of halibut, not the amount of crab. It should be noted that the proportion of salmon being handled is not mentioned in either the plan or the implementing regulations. This difference may simply be an oversight when the regulations were first drafted during 1978. The implementing regulations require the Regional Director to make adjustments on the basis of a determination that: (1) the condition of any groundfish or halibut stock in any portion of the Gulf of Alaska is substantially different from the condition anticipated at the beginning of the year, and (2) such differences reasonably support the need for inseason conservation measures to protect groundfish or halibut stocks.

The FMP requires the Regional Director to compare the effect of overall fishing effort and the relative abundance of stocks with preseason expectations. Hence, the implementing regulation also requires the Regional Director to make his determination on the basis of preseason expectations of groundfish conditions. Except for the April 1 starting date for the hook and line and pot fishery for sablefish, the fishing season begins on January 1 and ends on December 31, or until the quota is reached. Hence, preseason expectations are those that must be made during the prior fishing year.



Such limited comparisons prevent the Regional Director from using newly obtained information, which can, and often does, give him reason to make time/area adjustments. For example, results of scientific surveys often become available during the current fishing season. The overall effects of fishing effort, when compared against the survey results, may justify continuing or stopping fishing for a certain groundfish species in a management area. Under the FMP's current regime, the Regional Director is not technically allowed to compare the effects of fishing effort against the survey results, because such results were not derived preseason (i.e., prior to January 1).

The FMP allows the Regional Director to make time/area adjustments for conservation purposes only. NOAA has consistently interpreted conservation of groundfish resources to mean protection of those resources rather than the more classical definition of wise use. Consequently, extended fishing time to more fully utilize a certain groundfish species, perhaps as a result of reopening an area after it had been closed, is done usually with much bureaucratic difficulty. Other new information obtained inseason, which is socioeconomic in nature and important to the fishermen and the processors, should also be considered by the Regional Director when making his determination in making time/area adjustments.

## 6.2 The Alternatives

### A. Do nothing - status quo alternative.

Under the status quo alternative, time/area adjustments would be made inseason by comparing commercial fishery data with information known at the beginning of the fishing year. These adjustments would be made for conservation reasons only.

### B. Alternative 1: Authorize the Regional Director to modify gear, close, extend or open fisheries, and adjust TQ and PSC limits.

Inseason authorization for the Secretary, by means of his delegation to the Director, Alaska Region, NMFS, is provided to adjust gear restrictions, season opening and closing dates, and TQs and PSC limits. Such adjustments must be necessary to prevent overfishing or to change TQs or PSC limits which the Regional Director finds, as a result of the best available stock status information, to have been incorrectly specified.

The Regional Director is constrained, however, in his choice of management responses to prevent potential overfishing by having to first consider the least restrictive adjustments to conserve the resource. The order in which the Regional Director must consider inseason adjustments to prevent overfishing are specified as: (1): Any gear modification that would protect the species in need of conservation protection, but which would still allow fisheries to continue for other species; (2) a time/area closure which would allow fisheries for other species to continue in non-critical areas and time periods; and, (3) total closure of the management area and season.

An example of a potential gear restriction would be the closure of an area to non-pelagic trawling to prevent overfishing of a bottom dwelling species. The exercise of the Secretary's authority to adjust TQs or PSC limits requires

that adjustments be made only as a function of the best available scientific information that the biological status or condition of a stock is different from that on which the currently specified TQ or PSC limits is based. Any adjustments to the specified TQ or PSC limit must be reasonably related to the change in stock status. The Secretary may not make inseason adjustments based on any rationale other than a change in biological stock status.

For example, a PSC limit for a crab stock derived from a specific level of the crab biomass, could be adjusted upwards or downwards if the new stock status information showed that the crab biomass had changed.

If the TQ or PSC limit was based on factors other than the biological stock status of that species, however, the Regional Director would not be able to make the determination that the TQ or PSC limit was incorrectly specified. In the Gulf of Alaska, for example, the Council has routinely based the optimum yields for Pacific cod and flounders to control the halibut bycatch. In this instance, any change in the stock status of Pacific cod or flounders could not result in exercise of this authority since the TQs were not based on the stock status of these species.

The types of information which the Regional Director must consider in determining whether stock conditions exist that require an inseason management response are described, as follows, although he is not precluded from using information not described but determined to be relevant to the issue.

- (1) The effect of overall fishing effort within a regulatory area.
- (2) Catch per unit of effort and rate of harvest.
- (3) Relative abundance of stocks within the area.
- (4) The condition of the stock within all or part of a regulatory area.
- (5) Any other factors relevant to the conservation and management of groundfish species or any incidentally caught species which are designated as a prohibited species or for which a PSC limit has been specified.

Finally, the procedure which the Secretary must follow requires that the Secretary publish a notice of proposed adjustments in the Federal Register before they are made final, unless the Secretary finds for good cause that such notice is impracticable or contrary to the public interest. If the Secretary determines that the prior comment period should be waived, he is still required to request comments for 15 days after the notice is made effective, and respond to any comments by publishing in the Federal Register either notice of continued effectiveness or a notice modifying or rescinding the adjustment.

- C. Alternative 2: Authorize the Regional Director to make time/area adjustments to promote fishery conservation and/or promote socioeconomic interests in the fishery on the basis of all relevant information.

This alternative is similar to Alternative 1, except that the Regional Director would be authorized to open fisheries after consultation with the Council in the interest of furthering the fishing economy, as well as close fisheries for conservation reasons. Socioeconomic factors that he may consider are (4) and (5), listed below. Factors (1), (2), and (3) are conservation factors and ask the same as under Alternative 1, where again,

conservation is taken to mean wise use. Using all available information, he shall open or close fisheries in any or part of a regulatory area, or authorize the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit as a means of conserving the resource. Such actions must be necessary to prevent one of the following occurrences:

- (1) The overfishing of any species or stock of fish.
- (2) The harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species, which on the basis of currently available information is found by the Secretary to be too high.
- (3) The closure of any fishing for groundfish based upon the harvest of a TAC or the taking of a PSC limit, which on the basis of currently available information is found by the Secretary to be too low.
- (4) The failure to harvest a TAC for any groundfish as a result of weather conditions or the availability of facilities for the processing of the groundfish.
- (5) The failure to maximize the quantity or quality of roe extracted from any groundfish of which roe is a principal product.

### 6.3 Environmental Impacts of the Alternatives

#### A. Status Quo Alternative.

Under the status quo alternative, managers can close fisheries for conservation reasons, by comparing information obtained from the fishery with information available at the beginning of the fishing year. If this is the best available information, then the decision to close a fishery would likely be the most rational decision. Such a closure would be made to prevent overharvesting a groundfish species, and perhaps even overfishing of that species within the meaning of the national standard guidelines. However, information obtained which is more recent than that available at the beginning of the fishing year may be available which managers could not use according to current inseason authority. For example, newly obtained survey information may indicate that a certain species of groundfish is depressed and that further fishing to achieve a quota might harm that species. Overharvesting a groundfish species could result. As a result, other living marine species would be preyed on by fewer numbers of groundfish remaining in the system, and predators would find fewer numbers of those groundfish to prey on. Other impacts might include the influx of nutrients in the form of fish wastes from the overharvested species, discarded at sea, and consumed by various marine life. These impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment. As a practical matter, managers could implement an emergency rule, thus obviating the above scenario.

#### B. Alternative 1.

Under Alternative 1, the Secretary, through the Regional Director, would be authorized to make inseason adjustments to harvest levels, gear restrictions and season opening and closing dates by rule-related notice. Such adjustments

must be necessary to prevent overfishing or to change harvest quotas or bycatch limits which the Regional Director finds, as a result of the best available stock status information, to have been incorrectly specified.

The Regional Director is constrained, however, in his choice of management responses to prevent potential overfishing by having to first consider the least restrictive adjustments to conserve the resource. The order in which the Regional Director must consider inseason adjustments to prevent overfishing are specified as: (1) any gear modification that would protect the species in need of conservation protection, but which would still allow fisheries to continue for other species, (2) a time/area closure which would still allow fisheries for other species to continue in non-critical areas and time periods, and (3) total closure of the regulatory area or season.

An example of potential gear restriction would be the closure of an area to non-pelagic trawling to prevent overfishing of a bottom dwelling species. Any adjustments to the specific harvest quota or bycatch limits must be reasonably related to the change in stock status, and the Secretary may not make inseason adjustments based on any rationale other than a change in stock status.

The inseason adjustment authority provided by this alternative would allow the Regional Director to respond in a timely manner to changing environmental circumstances or stock conditions. He would thus be better able to prevent overfishing groundfish species, thus reducing the likelihood of the fishery-related impacts on the resource. No changes in the amounts of nutrients in the form of fish wastes discarded at sea are expected to occur. No changes in the effects on endangered species or the coastal zone are expected.

#### C. Alternative 2.

This alternative would allow the Regional Director to open and close fisheries for either conservation or socioeconomic reasons. The environmental impacts of Alternative 2 would be no less than with the previous alternative, but they could be perceived to be greater if fishing seasons were reopened for socioeconomic reasons. However, greater environmental impacts are unlikely since the socioeconomic factors are very specific and authorize inseason adjustments only for failure to achieve a harvest quota due to weather, or to maximize the roe quality in a roe fishery. In both cases the number of groundfish removed from the ecosystem would be the same. Regardless, the environmental impacts associated with inseason management adjustments would be undetectable and most likely insignificant within the range of natural dynamics of the ecosystem.

## 7.0 EFFECTS ON ENDANGERED SPECIES AND ON THE ALASKA COASTAL ZONE

None of the alternatives would constitute actions that "may affect" endangered species or their habitat within the meaning of the regulations implementing Section 7 of the Endangered Species Act of 1973. Thus, consultation procedures under Section 7 on the final actions and their alternatives will not be necessary.

Also, for the reasons discussed above, each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

## 8.0 FINDINGS OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

For the reasons discussed above, implementation of any of the alternatives would not significantly affect the quality of the human environment, and the preparation of an environmental impact statement on the final action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

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Assistant Administrator for Fisheries, NOAA

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Date

## 9.0 COORDINATION WITH OTHERS

The Gulf of Alaska Groundfish Plan Team consulted extensively with representatives of the Alaska Department of Fish and Game, National Marine Fisheries Service, members of the Scientific and Statistical Committee and Advisory Panel of the Council, and members of the academic and industrial community.

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REGULATORY IMPACT REVIEW/INITIAL REGULATORY FLEXIBILITY ANALYSIS  
FOR AMENDMENT 15 TO THE FISHERY MANAGEMENT PLAN FOR THE  
GROUNDFISH FISHERY OF THE GULF OF ALASKA

PREPARED BY THE PLAN TEAM FOR THE  
GROUNDFISH FISHERY OF THE GULF OF ALASKA  
AND THE STAFF OF THE  
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

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## 1.0 INTRODUCTION

The Gulf of Alaska groundfish fishery consists of a number of distinct fisheries that can be defined by gear, target species, and mode of operation. To some degree each of these fisheries is a multispecies fishery due to the use of partially selective gear or targeting strategies. These fisheries are characterized by: (1) resources that are subject to large fluctuations; (2) the rapid (and for most species complete) replacement of foreign fisheries by wholly domestic and joint venture fisheries; and (3) changing market conditions and opportunities as the domestic groundfish industry strives to become fully developed. The Gulf of Alaska Groundfish Fishery Management Plan (FMP), as implemented in 1978 and as amended through 1985, is not adequate for managing such a fishery. It has a number of major deficiencies, the costs of which have increased as the foreign fisheries have been replaced by wholly domestic and joint venture fisheries. These deficiencies will tend to prevent the fishery management goals from being met in the Gulf of Alaska. These goals as defined by the Magnuson Fishery Conservation and Management Act (MFCMA), related federal policy, and the Council are to: (1) protect the long-term productivity of living marine resources by preventing overfishing and fishing related degradation to fishery habitat; and (2) within the bounds set by this conservation goal, provide a management environment that will result in the allocation of these resources that will generate the greatest benefit for the nation.

The Council has primarily used harvest guidelines, or quotas, to manage the groundfish fisheries of the Gulf. The effectiveness of using overall harvest guidelines has been limited by an inability to accurately predict how a stock or the fishery as a whole will respond to a given harvest guideline and by the lack of an administratively efficient method for changing annual harvest guidelines in response to new information concerning the fisheries.

### 1.1 Background: Council Action to Date

A revision of the Gulf of Alaska Groundfish FMP was initiated during the December 1984 meeting of the North Pacific Fishery Management Council. Primary motivation for a revision was a continual increase in the number of proposed annual changes to the FMP. The Council formed a workgroup to begin work toward developing a set of goals and objectives for fisheries management in the Gulf of Alaska and also directed the Gulf of Alaska groundfish plan team (PT) to identify specific areas in need of change. In particular, the team was asked to identify management measures that require frequent revision and develop alternative measures that would streamline the plan and eliminate administrative delays.

The Council met in special session in August of 1985 to review the progress of both the plan team and the Goals and Objectives Workgroup and to provide direction for subsequent work. The workgroup has met five times since that August meeting, both independently and in conjunction with the plan team and Council staff. The product of those meetings are the goals and objectives approved for public review by the Council at its March, 1986 meeting. These goals and objectives are found in Chapter 2 of this document. The interaction between the workgroup and the plan team was intended to provide a set of alternatives that reflect the intent of industry as well as to adhere to biological and economic principles.

Four management problems which require immediate attention have been identified. They are:

- (1) The inability to adjust harvest guidelines efficiently.
- (2) Inadequate reporting requirements.
- (3) Inadequate protection of king crab in the vicinity of Kodiak Island.
- (4) Inadequate inseason management authority.

#### 1.1.1 Council Action in September

At its September 1986 meeting the Council approved Amendment 15 to the Gulf of Alaska Groundfish FMP for Secretarial review and implementation. The Council made its decisions after reviewing written public comments, public testimony, information contained in the draft Environmental Assessment (EA) and Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA), and the recommendations of the Advisory Panel (AP) and the Scientific and Statistical Committee (SSC). This section identifies those alternatives preferred by the Council and summarizes the rationale and background for their decision.

Two new alternatives were identified and selected as preferred solutions to the stated management problems during the meeting. For problem 1--inability to adjust harvest guidelines--a third framework approach was suggested by the plan team and SSC and adopted by the Council. For problem 3--king crab bycatch by non-pelagic trawlers in the vicinity of Kodiak Island--a variation intermediate between Alternatives 1 and 2 was suggested by the AP and chosen by the Council. The EA and RIR/IRFA have been revised to reflect these changes.

The scope and perspective of the analysis in the version of the documents sent out for public review, however, was sufficiently broad so as to bound the impacts of the new alternatives as well. It follows, therefore, that the analytical documents before the Council provided the information necessary for an informed decision.

#### Revised Goals and Objectives for Management of Groundfish

With this amendment the Council has adopted a principle management goal whereby the Gulf of Alaska groundfish resources will be managed to maximize economic benefits to the U.S., consistent with its resource stewardship responsibilities. To help meet this goal the Council approved seven objectives which concern the setting of harvest levels while keeping mortality above biological thresholds, the design of management programs to account for all fishery-related removals, the desire to minimize wastage of fishery resources, the intent to manage the groundfish fishery to stimulate development of the domestic industry, the development of effort control measures only when requested by the industry, and the rebuilding of stocks only if the benefits outweigh the costs.

In late-1983 the Council was requested by the fishing industry to stabilize the planning environment of the domestic seafood industry by developing long-range plans for management of the Gulf of Alaska groundfish fisheries. At that time the FMP contained several management goals and objectives which were more or less a restatement of MFCMA National Standards. It was believed

that more specific set of goals, pertaining to North Pacific fisheries in general, would provide a clearer sense of direction for the course of fishery management over the next decade. In December 1984 the Council adopted nine Comprehensive Fishery Management Goals. This set of comprehensive goals provided a basic framework for fishery-by-fishery development of specific goals and objectives. The new goal and supporting objectives contained in Amendment 15 is the Council's attempt to synthesize the priorities and concerns of the groundfish fishing industry and to articulate the current management philosophies and procedures, balancing and blending the two into a form that will guide the management process.

Management Problem 1: Inability to efficiently adjust harvest guidelines.

The Council approved a new alternative, Alternative 3, as recommended by the plan team and SSC. This alternative is a framework approach to setting target quotas for individual species in the Gulf using the same basic procedure that is used in the Bering Sea FMP. Additionally, Alternative 3 includes a procedure for establishing prohibited species catch limits (PSC) for fully U.S.-utilized groundfish species. This alternative, unlike Alternatives 1 and 2, does not provide for a formal accounting of fishery-related mortality.

Alternative 3 is viewed as an administrative amendment which allows the annual setting of harvest quotas without plan amendment. The Council concurred with the advice of the SSC, and a minority of the AP is encouraging the plan team to continue development of a catch/bycatch, accounting/management framework.

Management Problem 2: Inadequate reporting requirements.

The Council approved Alternative 1 which stipulates that each U.S. vessel that processes fish at sea during the fishing year must report its catch on a weekly basis whenever it has fish on board, regardless of how long it holds the fish on board. The revision to existing reporting requirements also includes a definition of fish processing. The Council believed this alternative superior to the status quo since it reduces the possibility of double counting fish and guarantees timely catch reports from this segment of the fleet.

Management Problem 3: King crab bycatch in Kodiak non-pelagic trawl groundfish fisheries.

The Council adopted Alternative 3 which establishes four time/area closures for non-pelagic trawling to protect king crab around Kodiak Island. All three alternatives were identical with the exception of the amount of area to be closed in Marmot Flats. Alternative 3, proposed by the Advisory Panel, closes more of Marmot Flats than Alternative 1 but less than Alternative 2. The small Marmot area of Alternative 1 was based on fishermen observations which showed a concentration of king crab in the area during the summer months. Additional testimony from fishermen at the Council's September meeting indicated that king crab migrate outside the small area at different times of the year. For this reason, the Council favored Alternative 3 since it would provide protection to king crab all year. Alternative 2 was rejected since the additional closed area did not appear to provide any significant benefits to king crab while the costs of closing the entire area to non-pelagic trawling appeared high.

#### Management Problem 4: Inadequate authority for inseason adjustment.

The Council approved a revised and clarified Alternative 1. This improvement of existing authority allows the Regional Director to use all relevant scientific information in making inseason time/area adjustments of the fishery. Their decision was based on the understanding that this authority will be used only in the case of true emergency, such as the prevention of overfishing. The Council intends that the least restrictive management response possible will be exercised, but that increasingly restrictive measures would be implemented as necessary. Alternative 2 was rejected by the Council since it allowed inseason adjustments of target quotas and bycatch limits for socioeconomic as well as conservation reasons.

The description of Alternative 1 in the EA and RIR/IRFA has been revised to reflect the Council's intent. The analysis in the earlier draft adequately described the impacts of the revised alternative.

#### 1.2 Purpose of the Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA)

In compliance with Executive Order 12291, the National Marine Fisheries Service requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions or for significant DOC/NOAA policy changes that are of public interest. The RIR: (1) provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems; and (3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are major under criteria provided in Executive Order 12291 (E.O. 12291) and whether or not proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with Regulatory Flexibility Act (P.L. 96-354, RFA). The primary purpose of the RFA is to relieve small businesses, small organizations, and small governmental jurisdictions (collectively, "small entities") of burdensome regulatory and record keeping requirements. This Act requires that if regulatory and record keeping requirements are not burdensome, then the head of an agency must certify that the requirement, if promulgated, will not have a significant effect on a substantial number of small entities.

This RIR analyzes the impacts that implementing the alternative solutions would have on the Gulf of Alaska groundfish fisheries. Certain information in this RIR is presented to satisfy basic requirements of E.O. 12291 and the RFA. The information presented addresses the objectives of and legal basis for the proposed rules; a description and estimate of the number of vessels (small entities) to which the proposed rules will apply; and an identification of all relevant Federal rules which may duplicate, overlap, or conflict with these proposed rules. A description of alternative solutions to the above problems that accomplish the stated objectives is presented in Chapters 3 through 6.

1.2.1 Statement of the objectives of, and legal basis for, the proposed rule.

This amendment is proposed under authority of the Magnuson Act. The Magnuson Act authorized promulgation of regulations implementing the management regime under which the Gulf of Alaska groundfish resources have been managed. The management regime was adopted by the Council to achieve the FMP's objectives and secondary objectives for the conservation and management of groundfish resources. This proposed amendment package will further these objectives (see Chapter 2).

1.2.2 Description and estimate of the number of small entities to which the proposed rule will apply.

The vessels fishing groundfish mainly in the Gulf of Alaska are considered to be small entities within the meaning of the Regulatory Flexibility Act. These vessels vary considerably in size and capacity to harvest and/or process groundfish. Vessels are from Alaska, Washington, and Oregon. The primary fishing gears used are hook and line gear (longlines), trawls, and pots. The latter gear type is being phased out in the sablefish fishery in the Gulf of Alaska as a result of Amendment 14 to the FMP, which was approved under authority of the Magnuson Act on September 26, 1985. A part of Amendment 14 banned a directed pot fishery for sablefish in the Eastern Area, effective in 1986; in the Central Area, effective in 1987, and in the Western Area, effective in 1988. Numbers of vessels to which this proposed rule will apply were obtained from the Alaska Department of Fish and Game's data on groundfish landings in the Gulf of Alaska in 1985 (Table 1.1).

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Table 1.1 Numbers of vessels by gear type, including longline, pot, and trawl, that made groundfish landings in the regulatory areas and districts of Gulf of Alaska during 1985 (Source: Alaska Department of Fish and Game).

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FMP MANAGEMENT AREA	GEAR		
	<u>Longlines</u>	<u>Trawl</u>	<u>Pot</u>
SOUTHEAST/EAST YAKUTAT	275	2	5
WEST YAKUTAT	82	2	.
CENTRAL GULF	167	35	7
WESTERN GULF	57	14	6
TOTAL GULF OF ALASKA <sup>1/</sup>	440	46	5 <sup>2/</sup>

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<sup>1/</sup> Total numbers represent actual vessel numbers by gear type that made landings during 1985 in the Gulf of Alaska. They are less than the sum of the numbers for each of the gear types by management area, because some of the vessels made landings in more than one management area.

<sup>2/</sup> Five vessels used pots as a gear type to target on groundfish in 1985. Eight more pot vessels targeting on crab caught and delivered small amounts of groundfish.



### 1.2.3 Federal rules which may duplicate, overlap, or conflict with the proposed rules.

The Secretary is not aware of any other Federal rules that may duplicate, overlap, or conflict with any of the proposed alternative management measures.

### 1.3 Methodology

The report addresses solutions to four identified fishery management problems. Chapters 3 through 6 specify the problems, propose solutions and analyze the regulatory impact of choosing one of the proposed solutions. The solutions are evaluated in light of the proposed revised goals and objectives for management of the groundfish in the Gulf of Alaska. Those objectives are presented and discussed in the next chapter.

Since this is a regulatory analysis the potential impacts on all users of the resource are examined: harvesters, processors, wholesalers, retailers and consumers. The analysis uses the perspective of cost-benefit analysis where costs are defined as losses (revenue loss, increased costs, etc.) and benefits are gains (revenue gain, decreased costs, etc.). These cost and benefits are quantified when possible. When lack of data prevents quantification the direction and approximate magnitude of the gain or loss is presented.

A cost-benefit analysis is directed towards learning the net benefits of adopting a new management strategy. As such there are two ways to quantify the change. For the first, the analyst calculates the benefits and costs of the proposed management regime; calculates the benefits and costs of the status quo; and calculates the difference. For the second, the analyst calculates the changes in benefits and costs brought about by changing management from the status quo. The second approach is used in this document as it is simpler and less data intensive.

Note that a relative benefit/cost analysis, as opposed to an absolute analysis, still satisfies the E.O. 12291 requirements for determination that the amendment will or will not have an annual effect on the economy of \$100 million or more.

## 2.0 THE GOALS AND OBJECTIVES OF FISHERIES MANAGEMENT IN THE GULF OF ALASKA

### 2.1 A Revised Set of Goals and Objectives for Management of the Gulf of Alaska Groundfish Plan - Implications

Two years ago industry requested that the Council develop a set of goals and objectives which would apply to all FMPs and that specific goals and objectives be developed for each plan. The overall goals and objectives for management were adopted by the Council in December 1984.

A Council-appointed workgroup on goals and objectives for the Gulf of Alaska FMP has drafted a revised set of goals and objectives for insertion in the Gulf FMP<sup>1/</sup>. The group's recommendations to the Council were approved for public review at the March 1986 meeting and are listed below.

#### Gulfwide Groundfish Management Goals and Objectives

The North Pacific Fishery Management Council is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States. Such management will:

- (1) Conform to the National Standards and to NPFMC Comprehensive Fishery Management goals.
- (2) Be designed to assure that to the extent practicable:
  - (a) commercial, recreational, and subsistence benefits may be obtained on a continuing basis;
  - (b) the chances of irreversible or long-term adverse effects on fishery resources and the marine environment is minimized;
  - (c) a multiplicity of options will be available with respect to future uses of these resources; and
  - (d) regulations will be long term and stable with changes kept to a minimum.

Principal Management Goal: Groundfish resources of the Gulf of Alaska will be managed to maximize economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economic benefits include, but are not limited to, profits, benefits to consumers, income, and employment.

To implement this goal, the Council establishes the following objectives:

Objective 1: The Council will establish annual harvest guidelines, within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

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<sup>1/</sup> The current goals and objectives for the Gulf of Alaska FMP can be found in Section 2.1 of the plan.

Objective 2: In its management process, including the setting of annual harvest guidelines, the Council will account for all fishery related removals by all gear types including sport fishery, and subsistence catches, as well as those made by directed fisheries, for each groundfish species.

Objective 3: The Council will manage the fisheries to minimize waste by:

- (a) Developing approaches to treating bycatches other than as a prohibited species. Any system adopted must address the problems of covert targeting and enforcement.
- (b) Developing management measures that encourage the use of gear and fishing techniques that minimize discards.

Objective 4: The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic groundfish fishery operations.

Objective 5: The Council will develop measures to control effort in a fishery, including systems to convert the common property resource to private property, but only when requested to do so by the industry.

Objective 6: Rebuilding stocks to commercial or historic levels will be undertaken after evaluating the associated costs and benefits and the impacts on related fisheries.

Objective 7: Population thresholds will be established for economically viable species or species complexes under Council management on the basis of the best scientific information, and ABCs will be established as defined in this document. If population estimates drop below these thresholds, acceptable biological catch (ABC) will be set to reflect necessary rebuilding as determined in Objective 6.

In the remainder of this chapter we examine the management implications of adoption of this set of goals and objectives. This examination is important from two perspectives: (1) as a change in the FMP itself; and (2) as a new "yardstick" against which all management alternatives are evaluated.

The most significant point of departure for the revised goals and objectives is the adoption of one overriding goal--that of maximization of economic benefits from management of the groundfish resources of the Gulf of Alaska. Although maximization of economic benefits is part of the National Standards its adoption as the principal management goal is new. It is intended that this overriding goal serve both as an overall guide and also as a principle which may be used to resolve conflicting management objectives or goals.

The seven objectives proposed by the work group serve to focus the overall management goal on particular problems. Objectives 1 and 2, taken together, imply that the Council will account for all groundfish fishing mortality and that the Council will establish harvest guidelines for all catch in the fisheries under Council control. Adopting this objective requires a catch accounting scheme which both considers target catch and bycatch. That part of Objective 2 which states that the Council will account for fishery removals from the sport fishery and from subsistence fisheries will be difficult to implement as estimates of these sources of mortality are currently unavailable.

Minimizing waste by avoiding the prohibited species approach (Objective 3) will be difficult given the current management situation. First, the absence of fishery observers on fully domestic fishing vessels complicates inseason accounting of catch discarded at sea and limits the ability to control targeting on valuable fully utilized species should the retention of fish be allowed. Second, it is the current interpretation of NOAA general counsel that domestic fisheries cannot be shut down while any retainable bycatch amounts remain in the joint venture or foreign fisheries. Thus, any measures which the Council can put in place to limit the incidental harvest of fully utilized species may not be enforceable for the wholly domestic fisheries, at least from the NMFS perspective.

Managing to stimulate development of fully domestic groundfish fisheries (Objective 4) can be accomplished in part by the frameworked catch accounting procedures presented as alternatives to problem 1; however, the alternatives listed do not explicitly give priority to developing fisheries.

Objective 5 simply states that the Council will not adopt any procedure which converts the common property resource to private property unless requested to do so by the industry. This precludes adoption of all limited access systems including limited entry, share quota systems, license ceilings, etc., unless the industry so requests. Such an objective implies that overcapitalization of the fleet may continue to be a problem.

Objectives 6 and 7 are concerned with rebuilding and overfishing. Rebuilding will not take place unless the benefits from that rebuilding outweigh the costs, including costs to other fisheries which harvest the species incidentally (Objective 6). However, if the population of an economically viable species should fall below its threshold rebuilding must take place (Objective 7), and ABC will be set to facilitate that rebuilding. An economically viable species is one where the benefits of rebuilding outweigh the costs. Note that in any case National Standard 1 prohibits overfishing.

Identification of the threshold level of a population is critical to the definition of overfishing. Unfortunately, given the current precision in the fishery population models, the plan team will be unable to establish any meaningful threshold population point estimates for most, if not all, of the managed groundfish species. This implies that a definition of overfishing related to some probability of long-term negative impacts needs to be developed. The SSC has suggested for Council consideration a definition along those lines.

The proposed solutions to the management problems identified in Chapters 3 through 6 will be examined in light of these proposed management goals and objectives.

### 3.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 1: INABILITY TO EFFICIENTLY ADJUST HARVEST GUIDELINES

#### 3.1 Introduction

This chapter considers three alternatives to the present procedure of establishing an optimum yield for each species or species groups in the Gulf of Alaska groundfish complex annually via emergency rule. The alternatives are framework procedures which allow annual adjustment of harvest guidelines within an overall OY range for the Gulf groundfish complex. These alternatives are thus similar to the overall OY framework used in managing the Bering Sea groundfish fisheries. The alternatives satisfy conservation objectives, establish harvest guidelines, and satisfy the Council's proposed management objective to account for all groundfish fishing mortality. Annual changes in harvest guidelines have become expected and routine and it is inappropriate to use emergency rule-making procedures and inefficient to amend the plan annually for anticipated revision of harvest guidelines.

The alternatives presented are thus an accounting stance and an attempt to streamline the annual setting of harvest quotas. These quotas will be called Total Allowable Catch (TAC) under the proposed change but the TACs are in fact comparable in all respects to the present single species optimum yields (OYs).

##### 3.1.1 The management problem.

Under the existing plan OYs are established for every groundfish species or species group being managed by the plan. Due to changes in stock status, most OYs have to be adjusted on an annual basis. Development of a domestic groundfish fishery and expansion of joint ventures also require consideration in establishing allocations to the domestic and joint venture fleets. Under the current plan actual setting of OYs require a plan amendment and may take 11 months or longer to implement. Emergency action has been required to have the most current OYs in effect when fisheries begin. To provide the administrative flexibility to set quotas on an annual basis, the Council directed the Gulf of Alaska plan team to develop management framework alternatives that would address this problem. In addition, they requested that the new framework measures encompass the Council's Gulf of Alaska revised groundfish management objectives where possible.

Specific OYs place two constraints on fishery management. First, the amount, species, or area of a harvest guideline can be temporarily adjusted with an emergency rule but cannot otherwise be adjusted without a plan amendment. Second, DAP, JVP, and TALFF must be defined by species and area and, therefore, the allocation options available are severely limited.

It is assumed that the adoption of Alternative 1, 2, or 3 will reduce the cost of adjusting harvest guidelines, but will not affect the setting of the actual harvest guidelines. This means that the quota for a species in 1987 is expected to be the same as the 1987 OY for that species should the plan not be amended. It follows that the magnitude of the problem is determined primarily by the additional administrative cost associated with not having an efficient procedure for adjusting harvest guidelines in response to changes in the fishery.

There are, of course, potential costs associated with continuing the status quo. These include costs to the industry brought about by uncertainty caused by the "emergency" nature of the annual quota setting and potential risk to the resource should the status quo perpetuate an inefficient harvest adjustment process.

### 3.1.2 The alternatives.

The alternatives to the status quo described in some detail and analyzed below are three framework procedures that specify a single OY as a range for the groundfish complex and permit harvest guidelines to be adjusted within the OY range without an emergency rule or amendment.

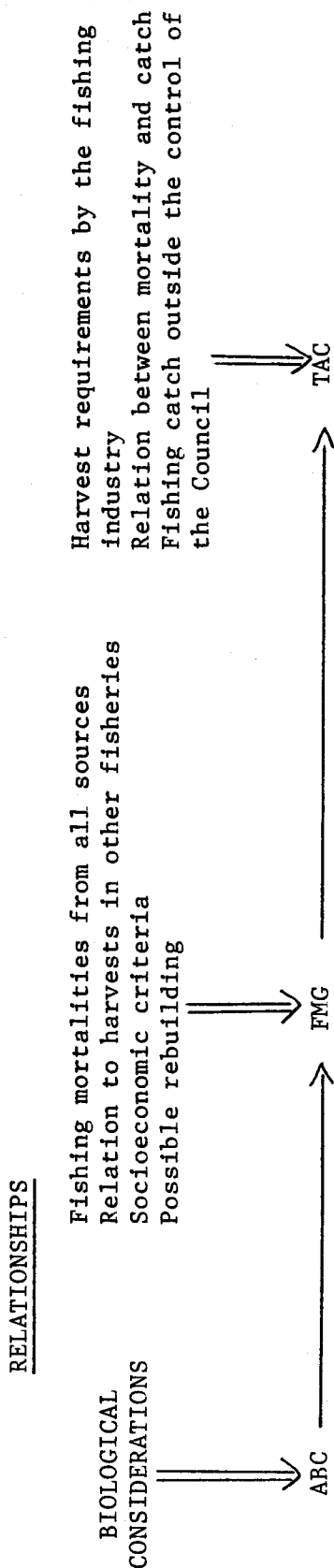
- A. Do nothing - status quo. Each species or species group has an OY specified. If, in the current fishing year, the level of overall fishing mortality is to change from that level, the regulations must be changed by emergency rule and/or formal plan amendment.
- B. Alternative 1: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels and specify a total allowable catch limit (TAC) for each groundfish fishery on an annual basis. The framework procedure is illustrated in Figure 3.1. The procedure consists of four steps:

- (1) Determining the allowable biological catch (ABC) for each managed species or species group.
- (2) Setting a fishing mortality guideline (FMG) for each species or species group by area as a limit on total fishing mortality, where total fishing mortality for a species consists of removal due to commercial groundfish fisheries that either target on that species (target mortality) or take it as bycatch (bycatch mortality) and removals due to all other fisheries (other fishing mortality). The FMG may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the FMG may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC in the next fishing year.
- (3) Establishing quota measures (TACs) designed to prevent the FMGs from being exceeded.
- (4) Summing TAC for all groundfish excluding nonspecified species to assure that the sum is within the OY range specified in the FMP. If the sum falls outside this range TAC must be adjusted or the plan amended.

The range of OY specified in the FMP is 116,000-800,000 metric tons of groundfish. This range was established by examining, for each major

Figure 3.1 Working definitions for use in harvest framework for management of groundfish in the Gulf of Alaska.



OY FRAMEWORK

Alternative 1:	$116,000 \text{ mt} \leq \sum TAC \leq 800,000 \text{ mt}$
Alternative 2:	$116,000 \text{ mt} \leq TGFM \leq 800,000 \text{ mt}$
Alternative 3:	$116,000 \text{ mt} \leq \sum TQ \leq 800,000 \text{ mt}$

DEFINITIONS

ABC	Acceptable biological catch	Is a seasonally determined catch that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitments. The Council can set the ABLs for individual species anywhere between zero and the maximum possible removal based on the best scientific information presented by the plan team and/or Scientific and Statistical Committee. The ABC may be modified to incorporate safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the maximum sustainable yield exploitation rate multiplied by the size of the biomass for the relevant time period. The ABC is defined as zero when the stock is at or below its threshold.
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Figure 3.1 continued

FMG Fisheries mortality guideline

A tolerable fishing mortality--an upper limit placed on the sum of target fishing mortality, bycatch fishing mortality, and fishing mortality on the species from recreational, subsistence, and nongroundfish fisheries. In deriving this estimate the team will consider possible rebuilding, all available estimates of the noncommercial fishery mortality, and the extent that the fishery is part of a mixed species fisheries, that is, the relation of the FMG to all other FMGs. Socioeconomic criteria may also be used. All considerations used in establishing FMG will be presented in the RAD.

PSC Prohibited species catch

A nonretainable catch. It can take the form of a prohibited or nongroundfish species and/or as a fully utilized groundfish species captured incidentally in groundfish fisheries. Such catch must be recorded and returned to the sea with a minimum of injury. A prohibited species catch limit (PSC) is an apportioned, nonretainable amount of fish provided to a fishery for bycatch purposes. PSC limits of groundfish may be provided to JVP and TALFF when the species is fully utilized by the wholly domestic fishery (i.e., DAP = TQ).

TAC/TQ Total allowable catch/Target quota

The harvest quota for a species or species group; the retainable catch. TAC will be apportioned to DAP, JVP, and, possibly, TALFF by area.



Figure 3.1 continued

TGFM	Total groundfish fishing mortality	An administrative concept where a predetermined range (116,000- 800,000 mt) is compared with either
		<ol style="list-style-type: none"> <li>1. The sum of the TACs/TQs (Alternatives 1 and 3), or</li> <li>2. The TGFM (Alternative 2).</li> </ol>
		<p>If (1) or (2) fall in the OY range no plan amendment is necessary and the TACs for the fishing season may be established by rule-related notice.</p>

Table 3.1 Historical annual groundfish catch in the Gulf of Alaska  
(in metric tons), 1965-1982.

<u>Year</u>	<u>SPECIES</u> <u>Landings, mt</u>						<u>TOTAL</u>
	<u>Pollock</u>	<u>Cod</u>	<u>Sablefish</u>	<u>Rockfish</u>	<u>Flatfish</u>	<u>Atka mackerel</u>	
1965	2,746	583	3,458	382,481	4,697	0	393,965
1966	8,940	459	5,178	148,439	4,928	0	167,944
1967	6,432	2,154	6,143	112,741	4,506	0	131,976
1968	6,168	1,046	15,049	108,594	3,468	0	134,325
1969	17,914	1,357	19,375	79,238	2,676	0	120,560
1970	15,970	1,830	25,694	63,674	3,859	7,281	118,308
1971	9,458	703	25,542	77,985	2,365	0	116,053
1972	34,166	3,572	36,453	77,564	8,942	6,282	166,979
1973	36,989	5,548	27,487	61,414	19,566	9,494	160,498
1974	61,474	5,353	28,006	61,193	9,733	17,531	183,290
1975	53,568	5,985	26,094	58,908	5,487	27,776	177,818
1976	79,526	7,089	27,733	56,983	6,092	15,539	192,962
1977	118,062	2,261	17,135	23,729	16,724	19,455	197,366
1978	97,405	12,167	8,875	10,198	15,180	19,586	163,411
1979	105,783	14,872	10,352	11,489	13,922	10,959	167,377
1980	115,037	35,327	8,509	16,088	15,889	13,166	204,016
1981	147,743	36,086	9,917	18,214	12,532	18,727	243,219
1982	168,746	29,380	8,557	10,731	7,729	6,760	231,903

Sources: Lynde, Magill. 1986. The historical annotated landings database documentation of annual harvest of groundfish from the Northeast Pacific and E. Bering Sea, 1957-1980. NOAA Technical Mem., NMFS F/NWC-103.

PacFIN final annual reports, 1981-1982.

Table 3.2 Gulf of Alaska MSYs, ABCs, and catches for the period 1983-87.

YEAR	Pacific Ocean									Totals, All species	
	Pollock	Pacific Cod	Flounders	Perch	Sablefish	Atka Mackerel	Rockfish	Thornyhead	Squid		
1983	MSY	334,000	177,000	67,000	150,000	25,000	33,000	10,200	3,750	5,000	804,950
	ABC	256,000	60,000	67,000	25,000	13,000	28,700	7,600	3,750	5,000	466,050
	Catch	215,608	36,401	12,260	7,406	9,002	12,260	2,001	730	271	295,939
1984	MSY	334,000	177,000	67,000	150,000	25,000	33,000	10,200	3,750	5,000	804,950
	ABC	516,600	60,000	67,000	21,875	9,480	28,700	7,600	3,750	5,000	720,005
	Catch	306,610	22,848	6,112	4,325	10,057	1,152	1,278	183	95	352,660
1985	MSY	334,000	177,000	67,000	150,000	25,000	33,000	10,200	3,750	5,000	804,950
	ABC	321,600	60,000	33,500	11,474	9,480	4,678	7,600	3,750	5,000	457,082
	Catch	291,489	14,442	2,157	925	11,887	1,848	442	38	12	323,240
1985	MSY	334,000	136,000	141,000	150,000	25,000	7,800	10,200	3,750	5,000	812,750
	ABC	116,600	136,000	141,000	10,500	18,800	4,700	n/a	n/a	n/a	n/a
	Catch(to date)	57,039	19,117	1,329	538	17,346	0	1,388	346	8	97,111
1987	MSY	334,000	125,000	340,000	150,000	25,000	7,800	10,200	3,750	5,000	1,000,750
	ABC/FHG	113,600	125,000	340,000	3,702	25,000	600	2,700	3,750	5,000	619,352
STATISTICS											
Range	MSY, min.	334,000	125,000	67,000	150,000	25,000	7,800	10,200	3,750	5,000	804,950
	MSY, max.	334,000	177,000	340,000	150,000	25,000	39,000	10,200	3,750	5,000	1,000,750
	ABC, min.	113,600	60,000	33,500	3,702	9,480	600	2,700	3,750	5,000	457,082
	ABC, max.	516,600	136,000	340,000	25,000	25,000	28,700	7,600	3,750	5,000	720,005
	Catch, min.	215,608	14,442	2,157	925	9,002	1,152	442	38	12	295,939
	Catch, max.	306,610	36,401	12,260	7,406	17,346	12,260	2,001	730	271	352,660
Mean	MSY	334,000	158,400	136,400	150,000	25,000	22,920	10,200	3,750	5,000	845,670
	ABC	264,880	88,200	129,700	14,510	15,152	13,476	6,375	3,750	5,000	565,622
	Catch(83-85)	271,236	24,564	6,843	4,219	10,315	5,087	1,240	317	126	323,946
Std. error	MSY	0	10,306	47,296	0	0	5,521	0	0	0	34,703
	ABC	66,793	15,524	49,587	3,501	2,673	5,599	1,061	0	0	55,009
	Catch(83-85)	22,988	5,223	2,400	1,528	683	2,933	368	172	62	13,372

groundfish species, historical and recent catches, recent determinations of ABC and the current and past estimates of MSY (Tables 3.1 and 3.2).

In particular, the end points of the range were derived as described below. The minimum value, 116,000 mt, is approximately equal to the lowest historical groundfish catch during the 21-year period 1965-1985 (116,053 mt in 1971). In that year catches of pollock, Pacific cod and Atka mackerel were all at their minimum value. Given the current status of the groundfish stocks and the present management regime it is considered extremely unlikely that future total harvests would fall below this level. Thus, TACs/PSCs and FMGs will be established so as to result in a sum of at least 116,000 mt.

The upper end of the OY range, 800,000 mt, was derived from MSY information. The MSY for all species of groundfish (excluding the other species category) has ranged from 804,950 mt in 1983 to 1,000,750 mt for the 1987 fishing year. The average MSY over the five year period is 845,670 mt. Therefore, the upper end of the range is approximately equal to 95% of the mean MSY for the most recent five year period. It is possible that, in the immediate future, the Council may wish to establish TAC as equal to MSY for each species. If this were to occur they would be constrained to either keep the groundfish TACs at or below 800,000 mt of groundfish or amend the OY range in the FMP.

The ABC summed for all species has ranged from 457,082 mt in 1985 to 720,005 mt in 1984, with an ABC recommended for 1987 of 619,352 mt. The upper end of the OY range is some 29% larger than the 1987 recommended ABC, allowing for future expansion in the fishery to that extent.

Most of the variation in the ABC and MSY over the five-year interval results from changes in the status of two species: pollock and flounder. Pollock ABC has ranged from 113,600 in 1987 to 516,600 in 1984, a greater than 400,000 mt variation. Likewise, flounder ABC was 33,500 mt in 1985 and 340,000 mt for 1987, while MSY has gone from 67,000 mt in 1983 to 340,000 mt in 1987. The variation in flounder ABC is therefore approximately 300,000 mt.

Therefore, the 800,000 mt upper end of the OY range was selected in consideration of the volatility in pollock and flounder ABCs, the potential for harvesting at MSY, and the desire to allow for some moderate expansion in the flounder fisheries.

- C. Alternative 2: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis. Mortality shall be explicitly accounted for at the end of the fishing year and compared against the OY range.

This alternative is very similar to the procedure described in Alternative 1. The Council will determine a fishing mortality guideline (FMG) for each species or species group being managed by the plan. Under both alternatives total allowable catches (TACs) will be set for the fishing year to prevent the FMGs from being exceeded. The DAP, JVP, and TALFF apportionments are also defined for the Gulf as a whole with specific allocations, if any, to each user group by species and area.

Alternative 2 differs from Alternative 1 by explicitly accounting for all groundfish fishing mortality at the end of the fishing year. Under Alternative 1, predictions of fishing mortality are used in setting quotas with the sum of total allowable catch (which itself is a predicted retainable harvest) compared to the 116,000-800,000 mt OY range. Alternative 2 uses the same approach in setting quotas, but, at the end of the year mortality is computed for each groundfish species being managed (FM), then summed for all species and areas to produce a total groundfish fishing mortality (TGFM). The TGFM is then compared to the OY range. The average TGFM for each three-year period (the three-year periods would be 1987-89, 1990-92, etc.) shall not exceed the upper end of the OY range, and the measures that are established to control TGFM shall permit TGFM to at least reach the lower end of the OY range.

With Alternative 1, TACs are estimated before the season starts, and with Alternative 2, all fishing mortality is counted once it has occurred. Since the final accounting is at the end of the fishing year with Alternative 2, the comparison to OY must be for a period longer than one year.

#### The Framework Procedure for Alternative 1 and Alternative 2.

The timing of actions to be taken under Alternative 1 and Alternative 2 in establishing total allowable catch (TAC) and an overall harvest guideline for comparison with the OY range is as follows:

- (1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary ABCs, FMGs, and TACs for all managed groundfish species. TACs will be specified for DAP, JVP, and TALFF. For fully utilized species the harvest amount specified for JVP and TALFF may be retainable bycatch amounts (TAC) or prohibited species catch limits (PSC). Each TAC or PSC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.
- (2) September Council meeting. Council will approve preliminary TACs and release RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TACs for DAP, JVP, and TALFF. Public comments on the proposed TAC will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TAC limits.
- (6) By January 1 the Secretary will file in the Federal Register a rule-related notice of final TAC limits.
- (7) January 1. Annual TAC limits (and PSC limits if specified) take effect for the current fishing year.

The Resource Assessment Document (RAD) will contain the following information:

- (1) Current status of Gulf of Alaska Groundfish resources, by major species or species group.
- (2) Estimates of maximum sustainable yield (MSY) and ABC.

- (3) Estimates of groundfish species mortality from nongroundfish fisheries, subsistence fisheries, and recreational fisheries and the difference between groundfish mortality and catch (if data are available).
- (4) Catch statistics (landings and value) for the current year.
- (5) The projected responses of stocks and the fisheries to alternative levels of fishing mortality.
- (6) Any relevant information relating to changes in groundfish markets.
- (7) Plan team recommendations for fishery mortality guidelines (FMG) and total allowable catch (TAC) by species or species group.
- (8) Any other biological, economic or sociological information which may be useful in establishing FMGs, TACs and PSCs.

The Council will use:

- (1) recommendations of the plan team and SSC and information presented by the PT and SSC in support of these recommendations;
- (2) information presented by the AP and the public; and
- (3) other relevant information,

to develop its own preliminary recommendations.

- D. Alternative 3: Establish an overall harvest framework procedure which establishes an OY range and provides a procedure for adjusting individual target quotas (TQ) and prohibited species catch limits (PSC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels by specifying a target quota (TQ) for each groundfish fishery on an annual basis. The procedure consists of four steps:

- (1) Determining the ABC for each managed species or species group.
- (2) Determining a TQ based on biological and socioeconomic information. The TQ may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the TQ may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC.
- (3) Identify what groundfish species will be fully utilized by the wholly domestic fishery. Determine a PSC limit in these fully utilized fisheries based on biological and socioeconomic information for joint venture and foreign fisheries. The sum of TQ and PSC for any groundfish species cannot result in overfishing.
- (4) Sum TQ for all groundfish species excluding nonspecified species to assure that the sum is within the OY range specified in the FMP. If the sum falls outside this range the TQs must be adjusted or the plan amended.

The timing of actions and procedure to be taken in establishing target quotas (TQs) is very similar to the schedule described under Alternatives 1 and 2:

- (1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary ABCs, and initial TQs for all managed groundfish species. TQ will be specified for DAP, JVP, and TALFF. For fully utilized species (where DAP = TQ), there

will be no retainable catch available for JVP and TALFF. Each TQ may be apportioned among the regulatory areas and districts of the Gulf of Alaska.

- (2) September Council meeting. Council will approve preliminary TQs and release RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TQs for DAP, JVP, and TALFF. Public comments on the proposed TQs will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TQ limits. Final TQs are added to assure that the sum is within the OY range.
- (6) By January 1 the Secretary will publish a rule-related notice of final TQ limits in FEDERAL REGISTER.
- (7) January 1. Annual TQ limits take effect for the current fishing year.

The OY range specified under Alternative 3 is the same as described previously under the other alternatives; or 116,000-800,000 mt of groundfish. The TQs will be summed with the total compared to the OY range. If the sum falls within the range, the Regional Director will implement the TQs. Should the sum fall outside the OY range, the Council must either adjust the TQs or amend the range in the FMP.

This alternative provides a specific procedure for the setting of bycatch limits of fully utilized groundfish species (i.e., DAP = TQ). Incidental catches of these species will be treated as "prohibited species", where such catch is nonretainable, must be recorded and returned to the sea with a minimum of injury. The timing of actions and procedure to be taken in establishing prohibited species catch limits (PSCs) of fully utilized species is as follows:

- (1) September. Following the initial determination of TQs for all managed groundfish species as described in Section 6.1, the plan team will identify those groundfish species that are fully utilized by the wholly domestic fishery. For those species, initial PSC limits will be calculated for joint venture and foreign fisheries using the best available bycatch rates obtained by NMFS observers from the respective fisheries and applying it to initial joint venture (JVP) and foreign (TALFF) TQ apportionments. Each PSC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.
- (2) September Council meeting. Council will review and approve preliminary PSCs and RAD for 30-day public review.
- (3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed PSCs for JVP and TALFF. Public comments on the proposed PSCs will be accepted by the Secretary for 30 days after the notice is published.
- (4) November. Plan Team prepares final RAD.
- (5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual PSC limits.

- (6) By January 1 the Secretary will publish a rule-related of final PSC limits in the FEDERAL REGISTER.
- (7) January 1. Annual PSC Limits take effect for the current fishing year.

For purposes of supplying scientific information to the Council for use in utilizing the above procedure, a RAD will be prepared annually as similarly described for Alternatives 1 and 2.

As with the status quo, a reserve system is used whereby 20% of each species or species group TQ is initially set aside for purposes of accommodating expanding DAP and JVP fisheries. The Regional Director may assess DAP or JVP and apportion to them any amounts of reserves that he finds will be harvested by U.S. vessels. The Regional Director may apportion to TALFF any portion of the reserves that he determines will not be harvested by U.S. vessels.

It should be noted that with Alternatives 1, 2 and 3 the attainment of a TAC/TQ for a species is intended to close the target fishery for a species. That is, once the quota is taken, further retention of that species would be prohibited. Other fisheries targeting on other species would be allowed to continue as long as the nonretainable bycatch of the species for which TAC/TQ has been attained does not result in overfishing. Similarly, when a groundfish PSC limit is reached the applicable fishery must close even if its target quota has not been harvested.

With the exception of the "other species" management category, the framework procedure described above is used to determine TACs or TQs for every groundfish species and species group managed by the plan. Groundfish that support their own fishery, and for which a sufficient data base exists that allows each to be managed on the basis of its own biological, social, economic, and ecological merits, are called "target species". Groundfish species that are currently of slight economic value and generally not targeted upon, but which have economic potential or importance to the ecosystem, yet lack sufficient data to allow separate management are grouped into the "other species" category. Accordingly, a single TAC/TQ, equal to 5% of the combined TACs/TQs for target species shall apply to this category. Records of catch of this category must be maintained.

All remaining species of fish and invertebrates taken incidentally that are not managed by other FMPs and are associated with groundfish fisheries, are designated as "nonspecified species" and catch records need not be kept.

### 3.2 Fishery Costs and Benefits

The 1985 groundfish fisheries in the Gulf of Alaska are major fisheries with a total harvest of 329,000 mt worth \$49.4 million at the exvessel level (Table 3.3). The framework alternatives attempt to reduce the administrative burden of annual plan amendment in these important fisheries and satisfy the first two objectives of this plan which are: (1) to establish annual harvest guidelines; and (2) to account for all fishing mortality in setting these guidelines. They would also address the seventh objective if thresholds as defined in objective seven are used as upper bounds on total fishing mortality guidelines. The current FMP is to some degree inconsistent with Objectives 1, 2, and 3 because it lacks an effective mechanism for adjusting annual harvest



Table 3.3 1985 groundfish landings, Gulf of Alaska by amount (mt) and exvessel value (\$1,000s)

<u>Species</u>	<u>WEIGHT (mt)</u>			<u>VALUE (\$1,000s)<sup>1/</sup></u>		
	<u>DAP</u>	<u>JVP</u>	<u>TALFF</u>	<u>DAP</u>	<u>JVP</u>	<u>TALFF</u>
Flatfish (flounders and soles)	752	2,447	170	219	338	22
P.O.P. group	863	254	8	242	50	3
Other rockfish	1,956	45	2	1,393	8	1
Thornyheads	81	8	4	40	2	1
Atka mackerel	--	1,846	2	--	281	0
Pacific cod	3,090	2,266	9,086	845	399	2,571
Sablefish	11,623	226	39	14,964	72	24
Pollock	22,012	237,860	31,616	1,213	22,835	3,857
Other	486	2,253	102			
<hr/> TOTAL	40,863	247,205	41,029	18,916 <sup>2/</sup>	23,988 <sup>2/</sup>	6,479 <sup>2/</sup>
% of Grand Total	12	75	12	38	49	13
GRAND TOTAL		329,096			49,383 <sup>2/</sup>	

<sup>1/</sup> Assuming retention and sale of the landed groundfish.

<sup>2/</sup> Does not include value of "Other" species category.

Source: Landings by weight, 1985 PacFIN (2/11/86). Values were computed using DAP, JVP, and foreign exvessel prices taken from 1985 PacFIN (2/11/86); Janet Smoker, pers. comm., and 1985 NMFS Foreign Fee Schedule, respectively.

guidelines, because there is no explicit reference to total fishing mortality, and because it requires the discard of groundfish bycatch in joint venture fisheries once an OY is taken.

In choosing among the alternative frameworks<sup>1/</sup>, it should be noted that although there are differences between them with regard to what is counted and when it is counted, in practice the three frameworks would impact the fisheries in essentially the same way. If fishing mortality summed over all groundfish species, excluding nonspecified species, exceeded 800,000 mt then the actions taken under Alternative 2 would differ from that taken under Alternatives 1 or 3. In this unlikely case, under Alternative 2 more restrictive measures would have to be imposed for the next two years or the OY range would have to be changed by a plan amendment. With Alternative 1 or 3, no change is necessary unless the sum of the TAC/TQs exceeds 800,000 mt. This is less likely to occur because it would be associated with a much higher total groundfish fishing mortality (TGFM).

Although in practice the three frameworks are similar, the accounting of total fishing mortality is explicitly more complete under Alternative 2 and the ability to make corrections over a multiyear period is also more explicitly defined under this alternative.

By amending the status quo, any of the proposed frameworks will tend to benefit the fishery by an amount equal to the part of the cost of the status quo borne by the fishery. This would include the cost of uncertainty due to the lengthy amendment process and uncertain emergency rule process.

Since the alternatives proposed are frameworked management measures it is appropriate to examine the bounds of impacts resulting from adoption of either framework. Since under all alternatives an overall OY range of 116,000-800,000 metric tons is specified, we can examine the probable range of fishery revenue that could occur if any of the frameworks were adopted. Call this range the range of possibility.

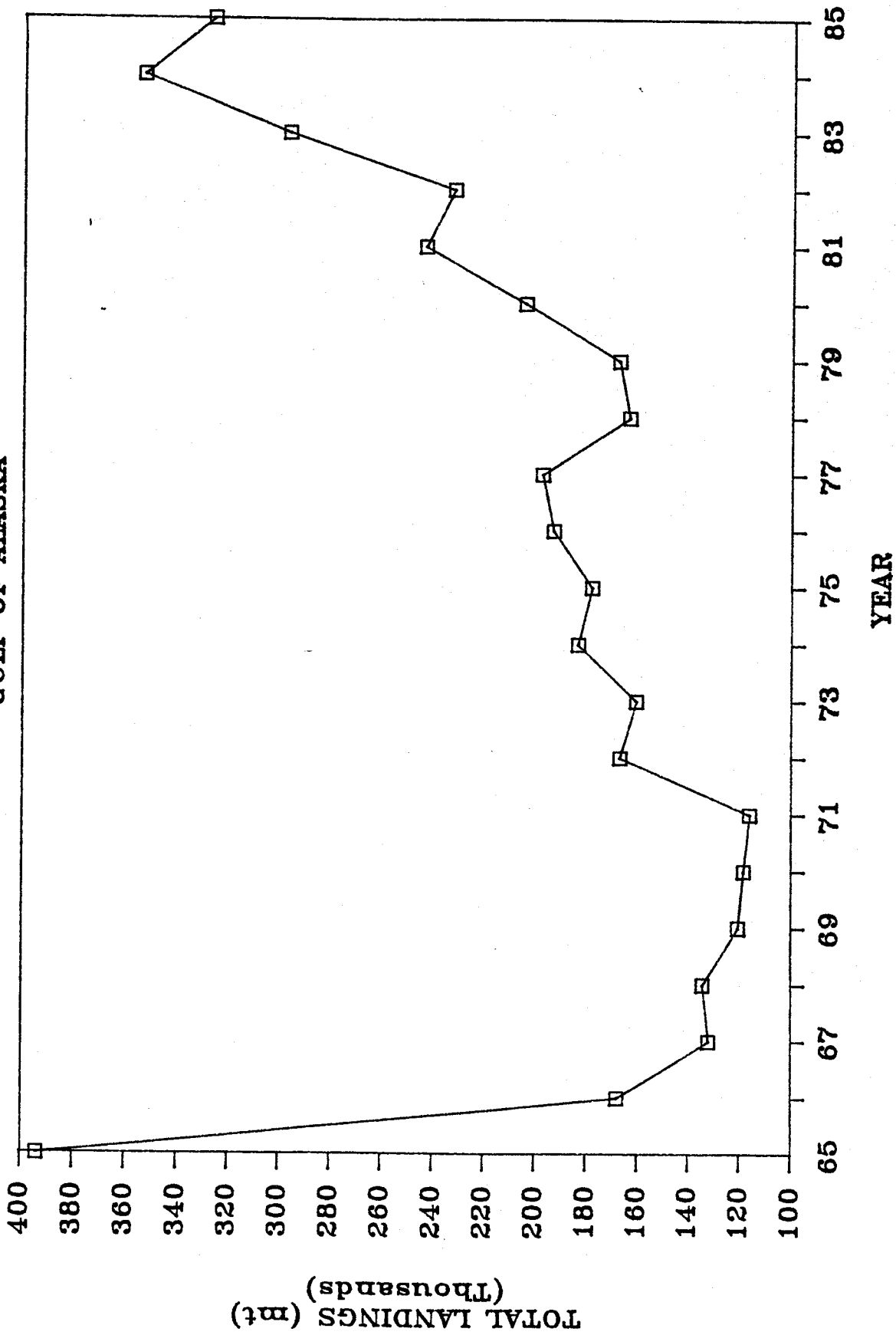
The extremes of this range are possible but not likely. Another range, a range of probability, can be derived from the time series of landings listed in Tables 3.1 and 3.2 and graphed in Figure 3.2.

Using the most recent history of Gulf groundfish landings (1983-85) and allowing for a confidence interval of 99% (an interval in which we would expect the total annual landings to fall 99% of the time) indicates that, on average, landings should be about 324,000 mt, worth approximately \$51 million (at current domestic prices). Note that the 1984 and 1985 landings exceed this mean value due to the relatively high abundance of pollock (Table 3.2).

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<sup>1/</sup> Alternatives 1 and 2 were developed by the plan team and sent out for public review. Alternative 3 was proposed during the September Council meeting by the plan team and SSC in response to comments from the public, SSC, AP and Council. Alternative 3 was chosen as the preferred alternative by the Council.

# FIGURE 3.2. HISTORICAL ANNUAL GROUNDFISH CATCH GULF OF ALASKA



Using the 99% confidence interval for each species value implies that the statistical range of exvessel values of these landings is \$34 million to \$69 million, if 1985 domestic exvessel prices are used to capture the potential value of a fully Americanized fishery. Of course, the DAP fisheries contribute value beyond the exvessel level given in these figures. In terms of catch, recent (1983-85) variation in landings indicate a statistical range of probable groundfish landings of 228,000-423,000 mt, again using the 99% confidence level. Unless there are substantial shifts in the groundfish populations in the near future, shifts different than those observed over the last several years, this range captures the probable limits on harvests and revenues. Thus, the potential loss and gain in exvessel revenue is approximately \$18 million should the harvest reach the limits of the range of probability.

Alternative 3 differs from the other two alternatives in the use of the term TQ instead of TAC. However, the TQ is identical to the old OY in all respects and thus there is no expected positive or negative impacts on the fleet under Alternative 3 since the harvest amounts are unchanged relative to the status quo harvest amounts.

Alternative 3 differs from the previous two alternatives in that it includes an administrative procedure for establishing, by rule-related notice, prohibited species catch limits (PSCs) for the joint venture and foreign fisheries for those species that are fully utilized by wholly domestic fisheries (DAP). The procedure determines a PSC for the JVP and TALFF fisheries by multiplying best available bycatch rates for the respective fisheries by the joint venture and foreign TQ apportionments in the appropriate target fisheries.

No positive or negative economic impacts to the affected fisheries from adoption of the PSC part of Alternative 3 relative to the status quo are expected. This is because the Council has used exactly this procedure for establishing PSC limits for fully U.S.-utilized species in the joint venture and foreign fisheries in the last two years. These December determinations of PSCs have then been implemented by the Secretary by emergency rule and permit conditions.

To the extent that adoption of Alternative 3 avoids the administrative burden of preparation of the emergency rule administrative costs may be reduced or redistributed. Note also that should the status quo be retained and should no PSC limits be established via emergency rule, joint venture and foreign fishing activity in the Gulf of Alaska would be precluded. In 1985 these fisheries harvested a total of 288,000 mt of groundfish worth in excess of \$30 million, using exvessel gross revenue.

### 3.3 Reporting Costs

Reporting costs are those costs which are borne by fishermen or processors in reporting catch and catch-related data to government agencies. The perspective of this RIR is one of analyzing the effects of the alternatives relative to the status quo. There are no additional reporting requirements proposed under Alternatives 1, 2, or 3, therefore, we anticipate no change in reporting costs borne by commercial fishermen or processors due to the implementation of any of the three alternatives.

### 3.4 Administrative, Enforcement, and Information Costs and Benefits

The costs associated with implementing an adjustment to a harvest guideline with any of the alternatives is expected to be \$110,000 less per year than with the status quo (Table 3.4). The primary savings is due to reduced staff and Council time required for plan amendments. It is not clear whether these would be actual reductions in the budget of the agencies or whether the reductions would allow existing personnel to direct their efforts toward other management problems. The enforcement and information costs under the status quo, Alternative 1, Alternative 2, and Alternative 3 are identical so no relative change in enforcement or information costs is expected.

### 3.5 Impacts on Consumers

The impact on consumers is expected to be similar with the status quo or any of the alternatives because neither the change in uncertainty, nor the change in the amount of discards are expected to measurably affect the price or quantity of fishery products available in the U.S. There are some efficiencies associated with a reduction in waste and some redistribution of supply may occur if bycaught fish are marketed by other than directed fishermen, but the effect on consumers should be minimal with the only possible impact being a slightly extended period of availability of fresh product.

### 3.6 Redistribution of Costs and Benefits

The replacement of the status quo with any of the alternatives is expected to result in benefits, or at least no change, to all concerned by eliminating inefficient administrative requirements for changing harvest guidelines.

### 3.7 Benefit-Cost Conclusion

If, as assumed, the harvest guidelines that would be implemented with the inefficient adjustment mechanism of the status quo are similar to those that would be implemented with the efficient mechanism of any of the framework procedures, the major effects of a change to one of the framework procedures would be an administrative cost reduction of approximately \$110,000. Therefore, there would be a net benefit to the U.S. and no measurable costs to those individually involved in harvesting, processing, marketing, or consuming fishery products.

Table 3.4. Administrative Costs of Plan Amendment versus Rulemaking for an OY Framework.

<u>NPFMC</u>	<u>Plan Amendment</u>	<u>Annual Rulemaking</u>
Council Time	\$ 63,700	\$ 25,200
Plan team meetings	12,000	4,000
Direct Staff	66,800	25,000
Supervisory and Support Staff	5,000	5,000
Mailing and Printing	3,500	1,800
Communications	2,700	1,800
Supplies	500	500
Travel	2,000	1,000
 <u>NMFS</u>		
NMFS-AK	11,630	4,720
NMFS-DC	<u>11,200</u>	<u>0</u>
	\$179,030	\$ 69,020

Source: NPFMC financial records and projections. The "Plan Amendment" column; assumes 5 Council meetings and 6 plan team meetings are devoted (in part) to amending the plan while the numbers in the column labeled "Annual Rulemaking" assume 2 Council meetings and 2 plan team meetings devoted (in part) to establishing the annual TACs.

#### 4.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 2: INADEQUATE REPORTING REQUIREMENTS

##### 4.1 Introduction

##### 4.1.1 The Management Problem

Current reporting requirements are of two types. First, operators of any fishing vessel are responsible for the submission to the Alaska Department of Fish and Game of an accurately completed State of Alaska fish ticket for each sale or delivery of groundfish caught in any Gulf of Alaska regulatory area. Second, operators of any catcher/processor and mothership vessel that freezes or dry-salts any part of its catch on board that vessel and retains that fish at sea for a period of more than 14 days from the time it is caught, or which receives groundfish at sea from a domestic fishing vessel and retains that catch for a period of more than 14 days from the time it is received, must submit to the Regional Director, Alaska Region, NMFS, a weekly catch or receipt report for each weekly period, Sunday through Saturday during which groundfish were caught or received at sea.

This latter requirement was necessary to aid management agencies in the inseason monitoring of groundfish catches. More timely catch and effort information was needed because large catches onboard catcher/processor and mothership vessels were not being reported for weeks or months through the normal fish ticket submission process. Without timely reporting, management agencies risked closing fisheries based on incomplete and unsatisfactory information that might cause either under or overharvesting of groundfish stocks.

One year's experience with the catcher/processor and mothership reporting system has revealed certain problems that reduce the effectiveness of the weekly reporting system. The most critical problem is the exemption from the weekly reporting requirement granted any vessel that lands its catch within 14 days. When a vessel which has been reporting weekly stops reporting or omits a report during one or more weekly periods because it was landed within a 14-day period, three problems are created. First, the absence of weekly catch reports for certain periods and vessels results in an incomplete accounting of catches for that segment of the fleet, which has led to inaccurate forecasts of quota achievement. The catch data submitted on fish tickets by catcher/processors and motherships often enter the management system too late to be useful for filling these data gaps in real time. Second, the reconciliation of fish tickets with weekly catch reports, where reporting periods often overlap, has resulted in significant delays and expense in compiling catch information due to the time spent resolving discrepancies in the data. The most common and serious discrepancy experienced to date has been double counting of catch, which has resulted in premature forecasts of quota achievement. Finally, inseason enforcement of the weekly reporting requirements has been rendered nearly impossible. When a vessel which has been reporting weekly stops reporting or skips one or more periods, enforcement agents are unable to act because of the possibility that the vessel lawfully reported by fish ticket.

#### 4.1.2 The alternatives.

##### A. Do nothing - status quo.

Vessels currently are required to report their landings via fish tickets to the Alaska Department of Fish and Game. Catcher/processor and mothership/processor vessels (defined as those vessels that salt or freeze their catch at sea) are required to file weekly reports with NMFS if their trip length exceeds 14 days. Those catcher/processors that land fish in 14 days or less are not required to submit a report to the Regional Director but must report to the Alaska Department of Fish and Game within seven days.

##### B. Alternative 1 (Council preferred alternative).

Under this alternative, any catcher/processor vessel that processes fish, where processing means to render it suitable for human consumption or use, would be required to report its catches weekly regardless of how many days there are between landings. Any mothership/processor that receives fish from a catcher vessel and retains it at sea for any time period, would be required to report weekly amounts of fish received from each catcher vessel. Reports would be required for each Sunday through Saturday period. The reports would be required even though that vessel had reported its catch through the State of Alaska's fish ticket system. This alternative would make inseason management of the fisheries more effective by: (1) eliminating time needed to resolve fish ticket discrepancies resulting from double counting, and (2) eliminating time lost due to delays in receiving fish ticket data. Inseason catches by catcher/processor vessels and catches received by mothership/processor vessels would be tabulated from just one source--the weekly report. Ease of monitoring the fishery inseason would increase and management decisions made during the course of the fisheries would be more accurate.

#### 4.2 Fishery Costs and Benefits

There is an oversight in the reporting requirements for catcher/processors which allows vessels to alternate their status and report as a catcher/processor one week and then land the following week under the Alaska Department of Fish and Game fish ticket system. By reporting under both systems, harvests are double counted and locating and eliminating those twice counted catches requires valuable time and labor. As a result NMFS receives inconsistent catch reports and is unable to accurately project landings and close fisheries before harvest quotas are exceeded.

Alternative 1 requires weekly reporting for all domestic catcher/processors and motherships. The present reporting system is unable to track sablefish harvests in a timely manner. Adoption of this alternative would reduce the probability of over or underharvests. The experience in 1986 indicates that overharvests were common (Table 4.1), although, it is clear that these overages were not all due to a lack of a timely reporting/monitoring system.

The sablefish catch-to-date in the Gulf of Alaska as of late September is 17,720 mt; 2,720 mt or 18% greater than the OY. The longline apportionment of the OY was exceeded by 1,643 mt in the central region, and by 128 mt in the western region, an overharvest of 36% for both regions combined. The trawl apportionment in the the Central Gulf was also exceeded by 502 mt or 41%.



Table 4.1 1986 Gulf of Alaska and Bering Sea/Aleutians Sablefish Domestic Catches (mt) (Date of report - October 14, 1986)

<u>Area</u>	<u>1986 OY</u>	<u>Catch to Date (9/86)</u>	<u>Season</u>	<u>Dates</u>
Southeast/E. Yakutat	3,578	3,804	closed	(4/1 - 4/17)
W. Yakutat	2,423	3,048	closed	(4/1 - 5/10)
Central LL (55%)	3,382	5,025	closed	(4/1 - 5/26)
Pot (25%)	1,538	1,053	open	(4/1 -
Twl (20%)	1,230	1,732	closed	(1/1 - 4/26)
Western LL (55%)	1,568	1,696	closed	(4/1 - 7/3)
Pot (25%)	713	787	closed	(4/1 - 6/9)
Twl (20%)	<u>570</u>	<u>570</u>	open	(1/1 - 10/7)
TOTAL	15,000	17,720		

Source: NMFS-Alaska Region, Janet Smoker, personal communication.

The Gulf of Alaska sablefish fishery is a high valued fishery with 1986 landings-to-date worth in excess of \$23 million at the exvessel level. Much of the product is exported to Japan where, in 1986, the market has remained stable with port-of-landing prices ranging from \$1.14/lb for smaller fish to \$2.50/lb for the larger sizes (Bill Atkinson News Reports (BANR), 1986). If in 1986, as in 1985, approximately 85%<sup>2/</sup> of the Japanese imports came from the Gulf of Alaska, 12,700 mt of Gulf of Alaska sablefish worth almost \$56 million will be delivered to Japan in 1986.

As effort in this fishery continues to increase shorter and shorter seasons will result and the tendency to exceed harvest quotas will in all likelihood also increase. It is therefore important to effect improvements in the catch reporting and monitoring system, at least in the sablefish fishery. Inappropriate or inadequate reporting and monitoring is, of course, only one aspect of the sablefish overharvest problem. Nevertheless, improvements in the reporting procedures could lead to improved management, and, eventually, a greater stream of long term benefits.

The current pattern of overharvests results in immediate gains in gross revenue at the exvessel, wholesale and retailing levels,<sup>1/</sup> but the increasing intensity and decreasing length of the season can and will lead to increases in operating costs. Moreover, short term gains in revenue may be offset by future declines in revenue and profits due to declines in resource availability should the overharvests lead to decreases in future biomass levels.

Unfortunately, it is impossible to link improvements in the reporting procedures in the Gulf of Alaska with changes in the long term profitability of the Gulf groundfish fisheries. That is, quantitative assessment of any increase in future revenues or profits due to adoption of Alternative 1 can not be made. Nevertheless, from a qualitative perspective the apparently modest increases in reporting costs seem to be more than offset by the potential gains should more effective long term management result.

With regard to the entire fleet, the reporting requirements as specified in Alternative 1 would improve the ability of NMFS to track all catches and reduce the chances of an overall overharvest or underharvest. The cost of overharvests are obvious. Excessive catches could reduce the population and lead to lower harvests in subsequent years. In the extreme, overharvests could threaten the long-term ability of the resource to sustain itself at biological or economically viable levels.

The cost of underharvests results from foregone harvests in any year. The cost to the industry would equal the potential profit lost from not being able to harvest fish.

#### 4.3 Reporting Costs

Catcher/processors would potentially have to increase their catch reporting under Alternative 1. Since the infrastructure of the reporting process is already in place, this should not substantially increase costs. Some catcher/processors, however, apparently avoid the status quo reporting requirements by

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<sup>1/</sup> If either there is no price decrease due to the supply change or if the market demands are price elastic.

<sup>2/</sup> This includes the conversion from round to dressed weight.

landing on the 13th day. It would seem that the lost fishing time and increased traveling time involved in landing catches more frequently would increase costs above the costs of reporting catches to NMFS. It is not possible to estimate these costs, but the fact that some fishermen avoid timely reporting implies that reporting costs may be substantial, although vessels may be landing catch in less than 14 days for reasons that have nothing to do with the current reporting requirements (e.g. marketing commitments, price fluctuations, etc.).

#### 4.4 Administrative, Enforcement, and Information Costs and Benefits

The infrastructure for NMFS reporting requirements already exists, thus Alternative 1 should not substantially increase the administrative costs. By eliminating the cause of double counting, NMFS would avoid the costs of finding and adjusting double counted catches.

Enforcement costs may increase to ensure that reporting requirements are adhered to by catcher/processors. This cost is not necessarily unique to Alternative 1 as there are currently improvements that should be made in enforcement of the status quo. At-sea enforcement costs should not increase under Alternative 1.

#### 4.5 Impacts on Consumers

Relative to the status quo, the alternative proposed should not affect price paid or product quality. Consumers would be affected by the proposed solution if that alternative either affected the quality of the product purchased by the consumer or resulted in a change in the quantity supplied to the consumer significant enough to affect the retail price. The proposed alternative would improve the administrative efficiency of the fisheries and, relative to the status quo, should not affect retail price or product quality.

#### 4.6 Redistribution of Costs and Benefits

The benefits of Alternative 1 do not accrue to any specific sector of the industry. If overharvesting is prevented all participants benefit proportionately in the long run. If underharvesting is prevented all participants benefit proportionately in the short run.

The costs from adoption of Alternative 1 take the form of potential increased reporting costs borne by domestic catcher/processors.

#### 4.7 Benefit-Cost Conclusion

Alternative 1 is proposed to correct a shortcoming in the reporting requirements implemented in Amendment 14. The benefit should be the decreased probability of both overharvesting and underharvesting and a distribution of benefits to the participants in the fishery more like that intended in Amendment 14. This will reduce the level of risk and uncertainty regarding the condition and stability of the resource confronting the industry. For example, the more timely and accurate information resulting from adoption of Alternative 1 will also decrease the probability of having to close and reopen a fishery, and thus avoid the associated costs to the fleet and managers.

Additionally, the more timely information will strengthen the ability to manage inseason. This is especially important given the rapidly developing domestic industry.

Adoption of Alternative 1 increases reporting costs. Out-of-pocket costs will differ little from the status quo. However, if fishermen find the additional reporting requirements particularly burdensome (for nonquantifiable reasons) out-of-pocket costs may underestimate the true costs. In the aggregate, the benefits to the industry and to the nation, attributable to a more comprehensive and timely reporting system, exceed the potential incremental cost increases imposed on a small portion of those harvesting this public resource.

## 5.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 3: INADEQUATE PROTECTION OF KING CRAB IN THE VICINITY OF KODIAK ISLAND

### 5.1 Introduction

#### 5.1.1 The management problem.

The number of mature red king crab in the waters around Kodiak Island is at historically low levels. As a result, the Kodiak commercial king crab fishery has been closed since 1983. During this same period a developing domestic groundfish fishery using a variety of gear has displaced most foreign fisheries.

In January 1986, the Council approved an emergency rule to close specified areas around Kodiak Island to bottom trawling while king crab were in their soft-shell condition. This action was believed necessary to protect the severely depressed Kodiak king crab stocks. The stocks have experienced little or no recruitment in recent years, and are subject to high mortalities from bottom trawls while in the soft shell condition. The emergency rule expired on June 15, 1986, when the soft shell period was believed to have ended. The Council action was intended to help rebuild the Kodiak king crab resource while still providing bottom trawl opportunities for groundfish fishermen. The action was to be an interim measure until a long-term solution could be developed.

In an attempt to allow industry to negotiate a solution to its problems, an industry workgroup was assembled at the request of the Council to review recent actions taken by federal and state management agencies and to develop a long-term solution that would meet the needs of all interested fishing industry groups. Supporting the workgroup were fishery scientists and managers who presented the latest biological and fishery information on the status of the king crab stocks and on areas where commercial fishing operations for groundfish, crab and shrimp are conducted. The workgroup developed a management alternative which is described under Alternative 1.

#### 5.1.2 The alternatives.

##### A. Do nothing - status quo.

Under the status quo there is no specific control of king crab bycatch in the Gulf of Alaska groundfish fisheries. The PSC framework for halibut established by Amendment 14 remains in effect (50 CFR 672.20e). The retention of halibut, salmon, and king and Tanner crab is prohibited in all domestic, joint venture, and foreign groundfish fisheries.

##### B. Alternative 1: Establish a time/area closure scheme for bottom trawling to help rebuild the Kodiak king crab resource as shown in Figure 5.1 and Table 5.1 for a period of three years from the year of implementation.

This alternative was developed by the industry workgroup and proposes establishing an area designation system with specific time/area closures. The area designations and management actions are as follows:

Table 5.1 Definitions of King Crab Bycatch Areas

<u>Area Type</u>	<u>Name and Definition</u>
I	Type I areas are those king crab stock rebuilding areas where a high level of protection will be provided to the king crab by closing the area year-round to bottom trawling. Fishing with other gear would be allowed.
II	Type II areas are those areas sensitive for king crab populations and in which bottom trawling will be prohibited during the softshell season (February 15-June 15). Fishing with other gear would be allowed and fishing with bottom trawl gear would be allowed from January 1-February 14 and June 16-December 31.

Areas designated as either Type I or II are shown in Figures 5.1 and 5.2.

In developing this alternative, the industry workgroup recognized that the future of the king crab resource is dependent on the ability of existing brood stock to successfully produce crab. Scientific data show that Alternative 1 provides protection to 85% of the Kodiak red king crab stocks, protects the most highly concentrated crab areas all year round, yet provides for groundfish fishing opportunities necessary to support the economic base of Kodiak communities. The workgroup also recognizes that once areas have been closed to fishing, there is often a reluctance to open those areas even when circumstances may have changed. Therefore, the time/area closure scheme presented in Alternative 1 will be in effect for three years from the year of implementation. At that time the Council will review the situation, the status of the king crab resource, the apparent effectiveness of the time/area closures, etc., to determine whether this approach to the king crab bycatch problem should be continued, abandoned, or replaced with a new alternative.

- C. Alternative 2: Establish a time/area closure scheme for bottom trawling similar to Alternative 1 except that a larger area of Marmot Flats is designated a Type I area, as shown in Figure 5.2 and Table 5.1, for a period of three years from the year of implementation.

This alternative is identical to Alternative 1 with the exception that the Marmot Flats area is expanded to match the boundaries defined by the Council's 1986 emergency rule (Figure 5.2). As in Alternative 1, the Marmot Flats, Alitak Flats and Towers areas would be designated Type I areas and the Chirikof and Barnabas areas designated as Type II areas. This alternative was developed for public review by the Council's Advisory Panel.

It should be noted that if the State of Alaska finds reason to open a shrimp fishery within the designated areas, these alternatives are not intended to prohibit such a shrimp opening.

- D. Alternative 3: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 2 except that a smaller part of the Marmot Flats area is designated a Type I area, as shown in Figure 5.3 and Table 5.1, for a period of three years from the year of implementation.

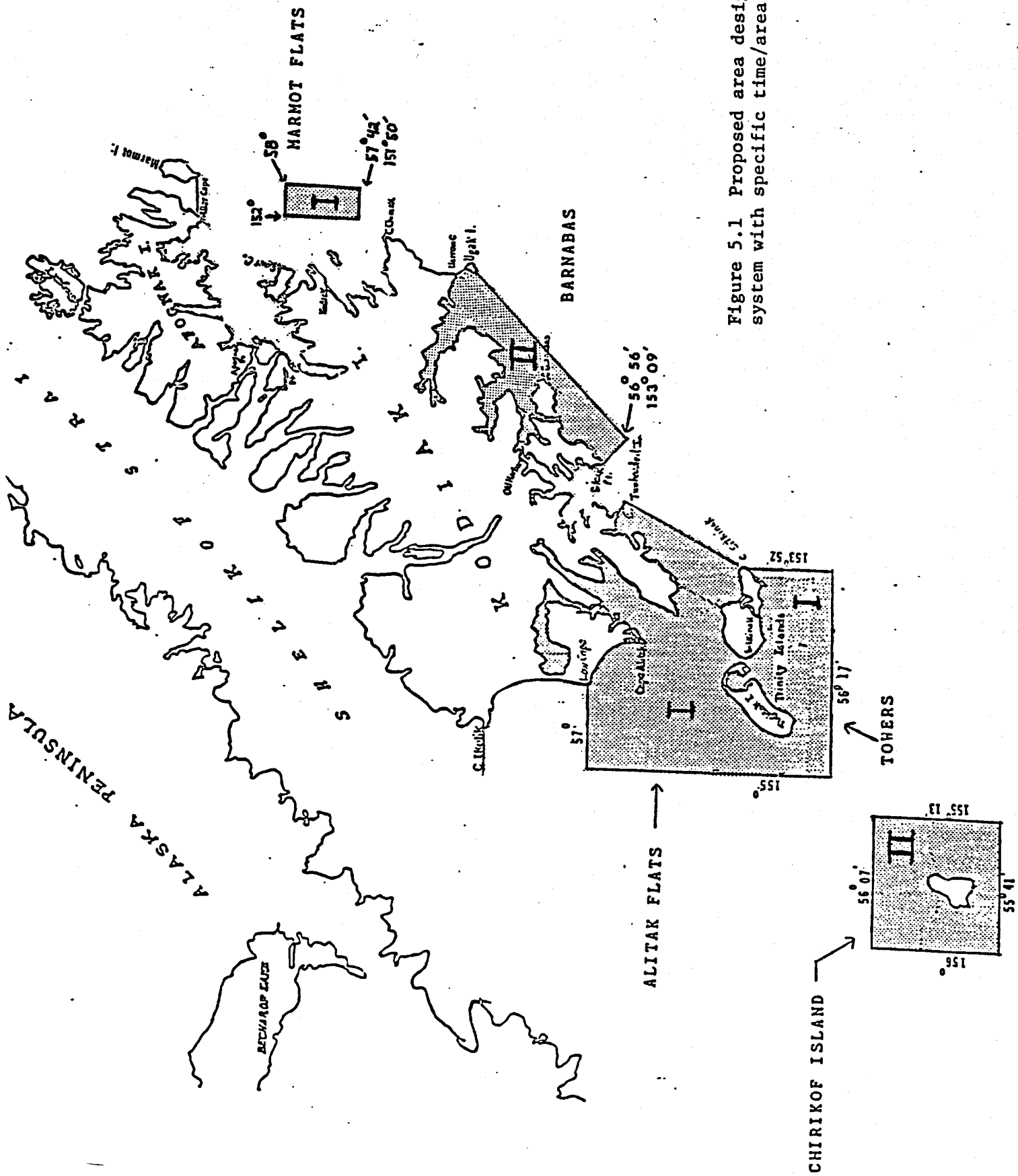


Figure 5.1 Proposed area designation system with specific time/area closures.





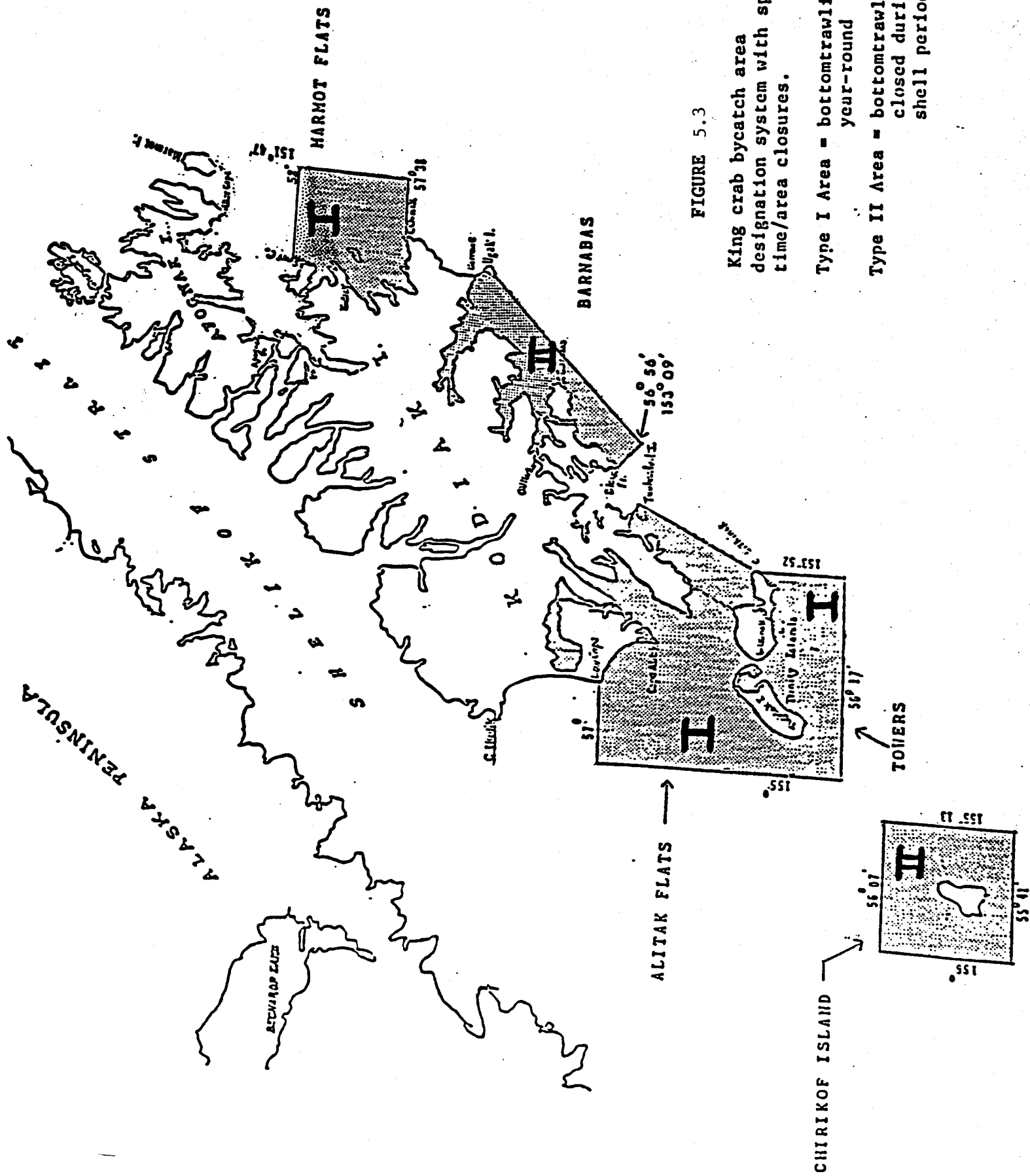


FIGURE 5.3

King crab bycatch area designation system with specific time/area closures.

Type I Area = bottomtrawling closed year-round

Type II Area = bottomtrawling closed during soft-shell period

This alternative is identical to Alternative 2 with the exception that the Marmot Flats area is reduced to match the boundaries specified by the Council's Advisory Panel at their meeting on September 23, 1986 (Figure 5.3). As in Alternative 1, the Marmot Flats, Alitak Flats and Towers areas would be designated Type I areas and the Cherikof and Barnabas areas designated as Type II areas.

## 5.2 Fishery Costs and Benefits

The alternatives to the status quo will affect two harvesting and processing sectors: those who harvest and process groundfish and those who harvest and process king crab and other nongroundfish species.

If areas in which bottom trawlers normally fish are closed, the fishermen must alter their current pattern of fishing. If we assume that the current distribution of effort is optimal, bottom trawlers face a potential decrease in profits. We assume that the fishermen will not simply accept the complete loss of harvest from the closed area, but that they will redistribute their effort to other areas, thus mitigating some of the reduction. This will, however, also increase costs by forcing the trawlers to scout new areas in search of bottomfish. The net result will be a reduction in total profit but less than the reduction that would occur assuming no redistribution.

The worst case scenario is if they make no attempt to redistribute effort. For example, if this regulation had been in effect in 1985 and the groundfish fleet had not redistributed displaced effort, the catch foregone in 1985 would have been about \$17,000 (Table 5.2) under Alternative 1.<sup>1/</sup>

Table 5.2 1985 weight and value of groundfish harvested in proposed trawl closures in the vicinity of Kodiak Island.

<u>Species</u>	<u>Quantity (mt)</u>		<u>Value (\$)</u>	
	<u>Alt. 1</u>	<u>Alt. 2</u>	<u>Alt. 1</u>	<u>Alt. 2</u>
Sablefish	2	2	\$ 1,460	\$ 1,460
Pacific Cod	27	44	7,799	12,710
Rock Sole	39	79	7,568	15,329

The catch figures used were aggregated by Alaska Department of Fish and Game Statistical Areas and do not coincide exactly with the proposed closed areas. It is not clear whether the impacts for Alternative 1 are over- or understated since some portions of the state's statistical areas include areas both outside and within the closure.

With regard to Alternatives 2 and 3 the same difficulty occurs in attempting to match state statistical areas to the proposed larger closed area in Marmot Flats. Under the assumption that the entire catch in the two additional state statistical areas encompassed by the closed area of Alternative 2 falls inside the Marmot Flats closure the potential lost revenue, assuming no redistribution of effort by the trawlers, would have been about \$29,500 in 1985. This

<sup>1/</sup> Catch figures in the area were provided by ADF&G and prices used were 1985 annual average trawl prices in the Central Gulf of Alaska as reported in the May 12, 1986 PacFIN report.

is \$12,700 more than under the Alternative 1. Note that both of these scenarios probably overstate the cost to the bottom trawlers because (1) it is assumed that the boats do not redistribute their effort, (2) it is assumed that all the catch in the two additional statistical areas occurred in the Marmot Flats portion of these areas (Alternatives 2 and 3), and (3) the estimates are of gross not net revenue.

Testimony was provided at the September 25, 1986 Council meeting by the Kodiak office of the Alaska Department of Fish and Game which estimated the population of legal male red king crab in the Marmot Flats area as between 50,000 and 100,000 animals. Charts which showed the distribution of this population indicated that the highest concentrations of crab were within and extending westward from that area closed under Alternative 1 and smaller concentrations in that portion closed under Alternative 2 north of 58°N latitude. In order to protect those areas which have the highest concentrations of red king crab and avoid unnecessarily restricting trawl operations, the Council closed that area shown in Figure 5.3 to non-pelagic trawling for the entire year.

Since the Marmot Flats closure of Alternative 3 is an extension of that found in Alternative 1 and a subarea of that closed in Alternative 2, the impacts of Alternative 3 on trawlers, as estimated in Table 5.2, would fall within the range of \$12,700 to \$29,500 in gross exvessel revenue.

There may be some benefits to fishermen who target on species prohibited in the groundfish fisheries and to the processors who sell the fish if the closed areas lead to increased protection and subsequent increased recruitment of these species, since closing the areas to protect depressed red king crab stocks will presumably prevent bycatch of other prohibited species such as Tanner crab and halibut. However, since the redistribution of effort is unknown, the catches of groundfish in the new areas and the quantities of bycatch of prohibited species are also unknown. Whether closures would result in higher or lower catches of those other prohibited species cannot be estimated without knowledge of how effort would be redistributed.

The areas proposed as closed to bottom trawling during all or part of the year were chosen to protect regions with particularly high abundance of red king crab. This protection may lead to increased recruitment into the king crab fishery which in turn would presumably result in increased directed harvests of king crab. It is impossible to forecast this effect since there is no satisfactory spawner recruit model available for the Gulf of Alaska red king crab stock. Moreover, trawl induced mortality on the red king crab is unknown, and, most importantly, the relation between that mortality and future crab recruitment is unknown.

Thus, little can be said quantitatively about the relation between closing an area to bottom trawling and future recruitment to the red king crab fishery. In order to do so, one would need to estimate the following:

- (1) The bycatch rate of king crab in the bottom trawl fishery by area and season.
- (2) The percent mortality of that bycatch as it is returned to the sea by area and season.

- (3) The natural mortality, growth rates, migration patterns, recruiting and fecundity of these "saved" crab.
- (4) The natural mortality (including susceptibility to predation), growth rates, migration patterns, and recruitment of these offspring.

We are unable to estimate any of these four items with any precision but can only infer that protection of some stocks of younger crab will eventually lead to additional recruitment.

A historical perspective implies that there are significant benefits should the red king crab stocks recover to past levels of abundance. During the last five years that the fishery was open in the Kodiak region (1978-1983), annual catch averaged about 16 million pounds which at \$3/lb. was worth \$48 million. Whether the proposed closures would have any positive effect on that recovery cannot be ascertained given our current knowledge of crab biology. However, the magnitude of the potential annual costs (\$17,000-\$29,000) have been deemed "acceptable" by the Council to justify the effort to restore the king crab fishery once valued at almost \$50 million.

### 5.3 Reporting Costs

The proposed alternatives to the status quo would not increase the reporting burden on fishermen or processors. The closed areas will be enforced using at sea enforcement, not by catch reporting. Therefore, relative to the status quo, the proposed time/area closures in either alternative should not change the reporting costs of any participant in the fishery.

### 5.4 Administrative, Enforcement, and Information Costs and Benefits

The proposed alternatives close areas to bottom trawling year round or during part of the year. In response to this change, enforcement officials can do one of two things: (1) obtain an increase in funding to maintain the status quo enforcement capability by increasing surveillance flights and cruises, or (2) reallocate enforcement activity from other areas and thus decrease the enforcement capabilities elsewhere. Each response represents a cost to the U.S. since Alternative 2 closes a larger area, the increase in enforcement costs would be somewhat greater than Alternative 3 which in turn would be somewhat greater than Alternative 1. However, it is important to note that enforcement costs pursuant to an area closure probably represents the minimal level of such costs relative to all possible bycatch controls.

### 5.5 Impacts on Consumers

The decrease in trawl catches is such a small percentage of the Gulf total that consumer prices should not be affected by the closures. If the closures contributed to the return of healthy red king crab stocks around Kodiak there would be an increase in benefits to consumers who purchase king crab if a lower price and/or greater availability result.

#### 5.6 Redistribution of Costs and Benefits

The costs of the proposed time and area closures are borne by the harvesters and processors of bottom trawl caught groundfish. There may also be increased enforcement costs from the adoption of this regulation.

The benefits will accrue to the harvesters of red king crab should the adoption of Alternatives 1, 2, or 3 lead to a future directed fishery.

#### 5.7 Benefit-Cost Conclusion

The costs of harvests foregone due to the time/area closures depends upon whether the effort can be redistributed and whether the lost harvests can be compensated for in other areas. There will be costs in terms of increased operating costs or lower catches if current effort patterns are optimal.

The benefits associated with the time/area closures depend upon the level of bycatch of prohibited species associated with the redistributed effort. It also depends on the ability of the red king crab stocks to reproduce given the protection afforded by the closures.

This management measure is for three years only and will be reevaluated at the end of that period. If, at that time, the Council takes no further action with regard to the problem of king crab bycatch by nonpelagic trawlers in the vicinity of Kodiak Island the provisions of Alternatives 1, 2, and 3 will expire and the fishery will be managed under the status quo.

## 6.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 4: INADEQUATE INSEASON MANAGEMENT AUTHORITY

### 6.1 Introduction

#### 6.1.1 The management problem.

The Regional Director, is currently authorized by the FMP to make inseason time/area adjustments in the Gulf of Alaska groundfish fishery. These adjustments are accomplished by field orders, which are regulations published in the FEDERAL REGISTER. The FMP states that the Regional Director may issue such field orders for conservation reasons only. His adjustments are to be based on the following considerations:

- (1) The effect of overall fishing effort within the area in comparison with preseason expectations.
- (2) Catch per unit of effort (CPUE) and rate of harvest.
- (3) Relative abundance of stocks within the area in comparison with preseason expectations.
- (4) The proportion of halibut, or crab being handled.
- (5) General information on the condition of stocks within the area.
- (6) Information pertaining to the optimum yield for stocks within the the statistical area.
- (7) Any other factors necessary for the conservation and management of the groundfish resource.

Except for 4 above, the implementing regulations at 50 CFR Part 672.22 roughly follow the language contained in the FMP. Concerning item 4, the implementing regulation only provides for consideration of the amount of halibut, not the amount of crab. This difference may simply be an oversight when the regulations were first drafted during 1978. The implementing regulations require the Regional Director to make adjustments on the basis of a determination that: (1) the condition of any groundfish or halibut stock in any portion of the Gulf of Alaska is substantially different from the condition anticipated at the beginning of the year; and (2) such differences reasonably support the need for inseason conservation measures to protect groundfish or halibut stocks.

The FMP requires the Regional Director to compare the effect of overall fishing effort and the relative abundance of stocks with preseason expectations. Hence, the implementing regulation also requires the Regional Director to make his determination on the basis of preseason expectations of groundfish conditions. Except for the April 1 starting date for the hook-and-line and pot fishery for sablefish, the fishing year starts on January 1 and ends on December 31, or until the quota is reached. Hence, preseason expectations are those that must be made during the prior fishing year.

The implementing regulations limit comparisons to fishery and observer data and may prevent the Regional Director from using other newly obtained information, which can, and often does, give him reason to make time/area adjustments. For example, results of scientific surveys often become available during the current fishing season. The overall effects of fishing effort, when compared with the survey results, may justify continuing or stopping fishing for a certain groundfish species in a management area. Under the FMP's current regime, the Regional Director is not technically allowed to compare the effects of fishing effort against inseason survey results, because such results were not derived pre-season (i.e., prior to January 1).

The FMP allows the Regional Director to make time/area adjustments for conservation purposes only. NOAA has consistently interpreted conservation of groundfish resources to mean protection of those resources rather than the more classical definition of wise use. Consequently, extended fishing time to more fully utilize a certain groundfish species, perhaps as a result of reopening an area after it had been closed, is done usually with much bureaucratic difficulty. Other new information obtained inseason, which is socioeconomic in nature and important to the fishermen and the processors, should also be considered by the Regional Director when making his determination in making time/area adjustments.

#### 6.1.2 The alternatives.

##### A. Do nothing - status quo.

Under the status quo, time/area adjustments would be made inseason by comparing commercial fishery data with information known at the beginning of the fishing year. These adjustments would be made for conservation reasons only. This implies that such adjustments would be limited to measures to reduce the allowable harvest below initial levels.

##### B. Alternative 1: Authorize the Regional Director to modify gear, close, extend, or open fisheries and adjust TQ and PSC limits.

Inseason authorization for the Secretary, by means of his delegation to the Director, Alaska Region, NMFS, is provided to adjust gear restrictions, season opening and closing dates, and TQs and PSC limits. Such adjustments must be necessary to prevent overfishing or to change TQs or PSC limits which the Regional Director finds, as a result of the best available stock status information, to have been incorrectly specified.

The Regional Director is constrained, however, in his choice of management responses to prevent potential overfishing by having to first consider the least restrictive adjustments to conserve the resource. The order in which the Regional Director must consider inseason adjustments to prevent overfishing are specified as: (1) any gear modification that would protect the species in need of conservation protection, but which would still allow fisheries to continue for other species; (2) a time/area closure which would allow fisheries for other species to continue in non-critical areas and time periods; and (3) total closure of the management area and season.

An example of a potential gear restriction would be the closure of an area to non-pelagic trawling to prevent overfishing of a bottom dwelling species. The exercise of the Secretary's authority to adjust TQs or PSC limits requires that adjustments be made only as a function of the best available scientific information that the biological status or condition of a stock is different from that on which the currently specified TQ or PSC limits is based. Any adjustments to the specified TQ or PSC limit must be reasonably related to the change in stock status. The Secretary may not make inseason adjustments based on any rationale other than a change in biological stock status.

For example, a PSC limit for a crab stock derived from a specific level of the crab biomass, could be adjusted upwards or downwards if the new stock status information showed that the crab biomass had changed.

If the TQ or PSC limit was based on factors other than the biological stock status of that species, however, the Regional Director would not be able to make the determination that the TQ or PSC limit was incorrectly specified unless, of course, the Regional Director determines that overfishing may result. In the Gulf of Alaska, for example, the Council has routinely based the optimum yields for Pacific cod and flounders to control the halibut bycatch. In this instance, any change in the stock status of Pacific cod or flounders could not result in exercise of this authority since the TQs were not based on the stock status of these species.

The types of information which the Regional Director must consider in determining whether stock conditions exist that require an inseason management response are described, as follows, although he is not precluded from using information not described but determined to be relevant to the issue.

- (1) The effect of overall fishing effort within a regulatory area.
- (2) Catch per unit of effort and rate of harvest.
- (3) Relative abundance of stocks within the area.
- (4) The condition of the stock within all or part of a regulatory area.
- (5) Any other factors relevant to the conservation and management of groundfish species or any incidentally caught species which are designated as a prohibited species or for which a PSC limit has been specified.

Finally, the procedure which the Secretary must follow requires that the Secretary publish a notice of proposed adjustments in the Federal Register before they are made final, unless the Secretary finds for good cause that such notice is impracticable or contrary to the public interest. If the Secretary determines that the prior comment period should be waived, he is still required to request comments for 15 days after the notice is made effective, and respond to any comments by publishing in the Federal Register either notice of continued effectiveness or a notice modifying or rescinding the adjustment.



- C. Alternative 2: Authorize the Regional Director to make time/area adjustments to promote socioeconomic interests in the fishery, as well as to promote fishery conservation, on the basis of all relevant information.

This alternative is similar to Alternative 1, except that the Regional Director would be authorized to open fisheries for socioeconomic reasons, as well as close fisheries for conservation reasons after consultation with the Council. Socioeconomic factors that he may consider are (4) and (5), listed below. Factors (1), (2) and (3) are conservation factors. Using all available information, he shall open or close fisheries in any or part of a regulatory area, or authorize or prohibit the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit as a means of conserving the resource. Such actions must be necessary to prevent one of the following occurrences:

- (1) The overharvest of any species or stock of fish.
- (2) The harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species which on the basis of currently available information is found by the Secretary to be too high.
- (3) The closure of any fishing for groundfish based upon the harvest of a TAC or the taking of a PSC limit which on the basis of currently available information is found by the Secretary to be too low.
- (4) The failure to harvest a TAC for any groundfish species as a result of weather conditions or the availability of facilities for the processing of the groundfish.
- (5) The failure to maximize the quantity or quality of roe extracted from any groundfish of which roe is a principal product.

## 6.2 Fishery Costs and Benefits

Those parts of Alternative 1 and 2 which involve the adjustment of TAC and/or PSC upward or downward do not differ conceptually from the impacts resulting from adjustment of TAC or PSC upward or downward prior to the fishing season. Inseason authority differs from an overall TAC framework only in the fact that adjustments are made inseason rather than preseason. This may carry with it some costs to the industry as a result of altered expectations relative to preseason planning information.

This generalization does not apply to (5) of Alternative 2. The costs and benefits of adopting inseason authority to manage the pollock roe fishery will be discussed at the end of this section.

The overall analytical perspective also does not apply to the adjustment of a pre-specified nongroundfish PSC. However, the only PSC proposed or in effect in the Gulf of Alaska is the halibut PSC. Inseason adjustment of this PSC is not anticipated given the current healthy condition of the halibut stock and the lack of a domestic bycatch monitoring program.

It is exceedingly difficult to analyze the potential impacts on the fisheries sector should Alternative 1 or Alternative 2 be chosen. This is because the alternatives give the RD considerable latitude in changing the TAC upward or downward, opening or closing fisheries, and allowing or prohibiting the use of certain fishing vessels or gear. Thus, even though the proposed alternatives are quite specific in limiting the reasons for action to named situations, no limit on the magnitude of the adjustment is specified; although, the Regional Director is constrained to employ the least restrictive adjustment to conserve the resource.

Since such inseason management authority has not existed in earlier versions of the Gulf of Alaska FMP we are also prevented from using a historical perspective in examining the proposed changes in the plan. It is customary in analyzing management measures that allow inseason or preseason adjustments in harvest levels (i.e., a frameworked measure) to examine the two polar cases that could occur: the minimum and maximum sets of numbers. Unfortunately, even this "bounds analysis" is impossible in the present situation.

The fishery costs associated with the proposed inseason management authority are those costs that might occur prior to December 31. The magnitude of the short-term impact will be determined by (1) the severity of the resource problems, or incorrectly specified harvest levels, and (2) the severity of the action necessary to address the problems. The biological cost to the resource would range from slowing down any rebuilding to a permanent crash in the population. Biological costs to the fishery are eventually translated into economic costs to the industry, although it may take several years for these costs to be realized.

Under the implementing regulations of the MFCMA the Regional Director is required to prevent overfishing. One of the major concerns these regulations address is that management not be so shortsighted as to allow short-term benefits to accrue in a fishery at the expense of a continuing stream of benefits for future generations. Inseason measures for reducing a TAC or PSC would be taken to preserve future benefits by preventing overfishing. This would only occur where FMP flexibility is inadequate in dealing with the situation.

When inseason management authority would be used to adjust a TAC or PSC upward immediate benefits would be realized by the fishery due to the increased potential harvest in the target fishery and the sale of that harvest. The stream of benefits may be subsequently reduced, however, should the increased harvest result in future biomass declines.

With regard to (5) of Alternative 2, the maximizing of the quantity or quality of the roe extracted from any groundfish of which roe is a principle product, the present pattern of fishing in the Gulf implies that there will be no economic impact in the fishery sector if (5) of Alternative 2 is adopted.

First, the only groundfish roe fisheries in the Gulf are the pollock fishery in Shelikof Strait and a new and developing DAP fishery for roe-bearing flatfish. Second, nearly all roe-bearing pollock are taken only in the joint venture fishery (approximately 58,000 mt in 1986). Third, not all joint venture operators pay a differential for roe-bearing pollock over non

roe-bearing pollock.<sup>1/</sup> Fourth, no operations pay a differential or bonus which is related to the roe content of the fish. In sum, adoption of this part of Alternative 2 will not affect fishery revenue unless institutional changes occur in joint venture contract negotiations or unless the developing DAP fishery for pollock and flatfish roe should establish differential pricing based on roe content. Therefore, the proposed action has no effective purpose at present, but would carry with it potentially significant monitoring costs, as well as potential allocation costs if some operators wish to fish at a lower (or higher) content level than selected as optimal.

### 6.3 Reporting Costs

The alternatives to the status quo are proposed solutions that increase the efficiency of management. The alternatives proposed would not require any change in the status quo regulations that deal with the reporting of harvests and harvest-related statistics by fishery participants. Therefore, no changes in the associated reporting costs would occur.

### 6.4 Administrative, Enforcement, and Information Costs and Benefits

Administrative, enforcement, and information costs would not be expected to differ from that of the status quo under Alternative 1.

Under Alternative 2 increased administrative costs would result from (5) due to the planning and conduct of a test fishery to monitor roe content inseason. Enforcement costs would increase relative to the status quo if the pool concept in the pollock fishery resulted in some operations "jumping the gun" and if NMFS chooses to enforce the delayed opening. Information costs would increase as it would be necessary to process information from the roe test fishery in a timely manner.

### 6.5 Impacts on Consumers

The proposed alternatives will not change: (1) how fishermen and processors handle their product, and (2) the retail price of the fishery products because adoption of either alternative is not expected to significantly change product quality or quantity. We therefore do not anticipate any change relative to the status quo in consumers' surplus due to the implementation of either alternative.

### 6.6 Redistribution of Costs and Benefits

The closure parts of Alternatives 1 and 2 will result in an immediate short-term revenue loss from that previously expected. This loss will be partially offset by potential harvest increases in future years. Conversely, the reopening option of Alternatives 1 and 2 will result in immediate gains in exvessel revenue and in other domestic sector profits. These gains will be partially offset by potentially reduced future harvests.

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<sup>1/</sup> Some Japanese companies negotiate a (preseason) price which takes into account the fact that more valuable roe-bearing pollock will be caught. Some Korean companies pay a differential of \$5-\$20/mt.

Under (5) of Alternative 2, increases in administrative, enforcement, and information costs are expected. These costs will be borne by the U.S. government.

#### 6.7 Benefit-Cost Conclusion

Substantial benefits may accrue to the fisheries sector should such authority prevent a premature closure. Adoption of the pollock roe section of Alternative 2 will increase the costs of management.

## 7.0 OTHER EXECUTIVE ORDER 12291 REQUIREMENTS

Executive Order 12291 requires that the following three issues be considered:

- (1) Will the Amendment have an annual effect on the economy of \$100 million or more?
- (2) Will the Amendment lead to an increase in the costs or prices for consumers, individual industries, federal, state, or local government agencies or geographic regions?
- (3) Will the Amendment have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets?

Regulations do impose costs and cause redistribution of costs and benefits. If the proposed regulations are implemented to the extent anticipated, these costs are not expected to be significant relative to total operational costs.

The Amendment should not have an annual effect of \$100 million or more since the total value of the catch of all groundfish species is about \$50 million. The value of the groundfish harvested by DAP fishermen in 1985 was \$19 million with \$24 million taken by JVP fishermen. However, only a small fraction of this catch might be effected by regulations implemented under this amendment. Where more enforcement and management effort is required, the cost to state and federal fishery management agencies will increase.

The Amendment should not lead to a substantial increase in the price paid by consumers, local governments, or geographic regions since no significant quantity or quality changes are expected in the groundfish markets.

The amendment will not have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets.

## 8.0 IMPACTS OF THE AMENDMENT RELATIVE TO THE REGULATORY FLEXIBILITY ACT

The Regulatory Flexibility Act requires the examination of the impacts on small businesses, small organizations, and small jurisdictions. In 1985 491 vessels participated in the Gulf of Alaska groundfish fishery. Data are not available to estimate the number of small businesses that may be involved in the fisheries for salmon, crabs, halibut and other fully utilized species in the area, but it may total several hundred. The impacts of the amendment do not favor large businesses over small business. Both large and small businesses are impacted by the proposed management measures.

Compliance costs include a change in the mandatory reporting requirements. These costs have not been estimated but should not substantially increase the reporting costs for domestic fishermen since the proposed change does not introduce any additional administrative procedures. Frameworking an overall OY will lead to reduced administrative costs of approximately \$100,000.

## 9.0 COORDINATION WITH OTHERS

The following persons were consulted during the preparation of this regulatory impact assessment: Jim Branson, Jim Glock, Judy Willoughby, North Pacific Fishery Management Council, Anchorage, Alaska; Janet Smoker, Bill Robinson, National Marine Fisheries Service, Alaska Region, Juneau, Alaska; Patrick J. Travers, Alaska Regional Counsel, NOAA, Juneau, Alaska; Fritz Funk, Barry Bracken, Alaska Department of Fish and Game, Juneau, Alaska; and Jim Balsiger, Grant Thompson, National Marine Fisheries Service, Northwest and Alaska Fisheries Center, Seattle, Washington.

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